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Report to Congress

Endangered and Threatened Species Recovery Program

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March 3, 1849

THE SECRETARY OF THE INTERIOR
WASHINGTON

ENDANGERED SPECIES ACT

Report of the Department of the Interior

Section 4(f)(3) of the Endangered Species Act requires that:

> **The Secretary shall report every two years to the Committee on Environment and Public Works of the Senate and the Committee on Merchant Marine and Fisheries of the House of Representatives on the status of efforts to develop and implement recovery plans for all listed species listed pursuant to this section and on the status of all species for which such plans have been developed.**

The responsibility of the Department of the Interior is limited by Section 3(14) of the Endangered Species Act, which outlines the responsibilities of the Secretaries. The Secretary of Commerce is generally responsible for most marine species (except birds), and the Secretary of the Interior is generally responsible for birds and terrestrial and freshwater species. Exceptions include the West Indian manatee, sea turtles (on land), and sea otters, which are under the Secretary of the Interior's jurisdiction.

Accordingly, published herewith is the first report of the Department of the Interior in accordance with the requirements of the 1988 amendments to the Endangered Species Act, on the recovery program for federally listed species under the Secretary of the Interior's jurisdiction. This report represents the recovery status of listed species occurring in the United States and/or trust territories through September 30, 1990.

Manuel Lujan Jr.

Report to Congress

Endangered and Threatened Species Recovery Program

Prepared by
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U.S. Fish and Wildlife Service
Washington, D.C. 20240

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Report to Congress

Endangered and Threatened Species Recovery Program

EXECUTIVE SUMMARY

Background

On October 7, 1988, President Reagan signed into law a bill amending the Endangered Species Act (Act) and authorizing increased appropriations to implement the Act through fiscal year 1992 (Public Law 100-478). One of the major amendments made more specific the general requirement that the Secretaries of the Interior and Commerce develop and implement recovery plans.

The amendment further directs the Secretary to report every two years on the status of efforts to develop and implement recovery plans for all listed species and on the status of all species for which recovery plans have been developed.

This report is the first Report to Congress on the status of the Recovery Program for federally listed endangered and threatened species under the Secretary of the Interior's jurisdiction.

Recovery

Recovery is the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is the maintenance of secure, self-sustaining wild populations of species with the minimum necessary investment of resources.

The goal of the Fish and Wildlife Service's (Service) recovery program is to: (1) identify those ecosystems and organisms that face the highest degree of threat, (2) determine tasks necessary to reduce or eliminate the threats, and (3) apply the resources available to the highest priority recovery tasks. The ultimate goal is to restore listed species to a point where they are viable self-sustaining components of their ecosystem, so as to allow delisting.

The first step in the recovery process is the development of species-specific recovery goals and the identification and ranking of species information and management needs in terms of their relative importance and timing for recovery. This information is typically set forth in a recovery plan. A recovery plan delineates, justifies, and schedules the research and management actions necessary to support recovery of a species, including those that, if successfully undertaken, are likely to permit reclassification or delisting of the species. Recovery plans are prepared to help organize species information and management needs. These plans are comprehensive documents that identify all known recovery actions for a species and associated costs by all cooperating agencies. They serve as a blueprint for private, Federal, and State interagency cooperation in the implementation of recovery actions. A recovery plan is a document that sets forth the information base and management needs to allow the species a chance at recovery so that protection under the Endangered Species Act may no longer be required.

The recovery planning process provides for public participation to enhance coordination and acceptance, which are vital to species' survival and eventual recovery. The Service recognizes the need to develop recovery plans for listed species and has increased efforts in this area, particularly by increasing the number of multi-species recovery plans, coordinating plan preparation, and identifying plans where other conservation agencies can participate in order to accelerate critical recovery task implementation.

While reclassifications and delistings demonstrate that there can be successes in recovery, removal from the list is not a reasonable goal for all endangered species. Primary recovery efforts generally aim at stabilizing or reversing deterioration of a species' habitat or decline in its numbers and then restoring it to a condition in which it is likely to survive over the long term. A more realistic measure of the Service's recovery efforts than the number of species delisted is probably the proportion of listed species whose status has been stabilized, particularly among species that are habitat-limited and thus more vulnerable to changes in their environment. Maintenance of remaining populations of listed species and prevention of their extinction is a basic objective of the program.

Report Overview

The **Species Status Report** is divided into four major sections. Appendices presenting each section are explained below. The Lead Region is listed for each species. Coordination among Regions regarding species' status occurs when known ranges overlap Regional boundaries.

Appendix I addresses the status of each species with an approved recovery plan. Each species' status is identified as Improving, Stable, Declining, Unknown, or Extinct.

Appendix II outlines the status of development and implementation of recovery plans for all species occurring in the United States and/or Trust Territories.

Appendix III indexes all listed species by State(s) and/or territory of occurrence. Each State and/or Trust Territory is listed individually with listed species cross-referenced with a "**Species Account Number**". The Species Account Number directly relates to the Individual Species Recovery Report in Appendix IV.

Appendix IV provides individual species recovery progress reports for all species occurring in the United States and/or Trust Territories. An index of the species, listed alphabetically by common name, is at the end of Appendix IV.

This year's report includes all species listed as of **October 1, 1990.** Recovery plan information is current through **September 30, 1990.** Data are outlined for species occurring in the United States and/or Trust Territories only. *No foreign species are reported.* The date of listing for each species is the date the rule was published in the *Federal Register*. The effective date of the rule is usually thirty days succeeding publication in the *Federal Register*.

As of October 1, 1990, 581 species were listed as endangered or threatened in the United States and/or Trust Territories. All taxonomic groups are represented.

Four hundred and fifty-two of the species have been listed for longer than 3 years. Species listed in the last 3 years have been dominated by plants (58%). Most species listed less than 3 years do not yet have final approved recovery plans. Many, however, have plans in some stage of development. Recovery outlines are developed within 60 days of publication of the final rule listing a species and are submitted to the Service Director to be used as a guide for activities until recovery plans are developed.

Individual species recovery priorities are assigned using the Service's published guidelines. Sixty-one percent of the species are assigned high recovery priority numbers, signifying an imminence of extinction for nearly two-thirds of the listed species. Approximately 35% are assigned moderate recovery priority numbers and 4% are assigned low numbers. High priorities are assigned across all taxonomic groups with no bias towards any taxonomic group.

An additional designation "C" is appended to those species recovery priority numbers where a known threat or "conflict" exists. Approximately 25% of listed species have possible conflicts with development projects or other forms of economic activity. The majority of listed species are not in conflict with other activities.

Of the 581 U.S. listed species, 352 (61%) have approved recovery plans as of October 1, 1990.

Eighty-three percent of listed species have either an approved recovery plan or one that is in some stage of development. Eighteen (3%) of the species will not have recovery plans prepared. Of the 81 species with recovery plans "pending," that is, planned but not yet initiated, 41 have been listed less than 3 years. The remaining forty (7%) of the species that warrant having recovery plans developed, but have yet to have a plan initiated, have been listed longer than 3 years. The 7% constitutes the actual recovery plan backlog in the Fish and Wildlife Service.

Most of the species considered to be improving are mammals, birds, or plants. A significant majority of them are recovering from very low numbers, with the benefit of intensive, hands-on management. Bird and fish species represent the taxa considered to be the most stable. The unknown component is most pronounced in invertebrates, reflecting a need for additional studies. Three-fourths of the prominent declining status of invertebrates are freshwater mussels.

Species with approved recovery plans have a higher percentage of improving status designations than those without plans (14% versus 3%). Implementation of recovery plan tasks provide significant gains towards positive species recovery efforts. The most significant recovery status difference between the species with and without approved recovery plans is the number of "unknowns" for those species without recovery plans (25% "unknowns" without plans versus 16 % with plans). Recovery plans also outline research efforts needed to assess a species' status and begin the downward trend reversal.

Four hundred and thirty-nine of the 581 species (76%) have less than 25% of their recovery objectives achieved. The high percentage includes all species listed within the last three years. In addition, it indicates the long-term nature of listed species recovery.

Summary

The Service has placed increased emphasis on recovery planning. A process has been developed to reduce the backlog of species without recovery plans. Target timeframes have been established to guide the development of draft and final plan preparation.

Both an overall trend towards recovery and the time dimensions of that trend have been evaluated. Species listed longer appear to have a better chance of becoming stable or improving.

A commitment to endangered species recovery is needed for a long time to allow for noticeable results. Long-term planning is needed to address the program objectives. Though the timeframe involved may be perceived as long, recovery can and does happen. A serious commitment of both personnel and money is important to ensure the stabilization and recovery of listed species, and the longterm support of biodiversity.

Introduction

The American bald eagle is making a remarkable comeback, the American alligator no longer requires Endangered Species Act protection, and the Aleutian Canada goose was recently reclassified from endangered to the less critical threatened category because of dramatic population increases over the years.

These are just a few of the recent and highly publicized endangered species success stories.

But lesser known are the hundreds of endangered and threatened species of plants, snails, butterflies, fish, and other wildlife appearing on the pages of the List of Endangered and Threatened Wildlife and Plants. Some are benefitting greatly from protection under the Endangered Species Act while others are still struggling.

This Report to Congress represents the first comprehensive accounting of the recovery progress for all 581 Federally listed endangered and threatened species occurring in the United States or Trust Territories as of October 1, 1990. It contains summaries of current and planned recovery activities for federally protected species under the jurisdiction of the Secretary of the Interior, from well known species such as the California condor to lesser known ones such as the Appalachian monkeyface pearly mussel. The report also contains information on the status of recovery plan development, a state by state breakdown of listed species, and comparative charts illustrating the recovery picture for different taxonomic groups.

This report is a requirement of the 1988 amendments to the Endangered Species Act and will be updated every two years. The report does not address species under the jurisdiction of the U.S. Department of Commerce, National Marine Fisheries Service (NMFS). The recovery status of those marine species is described in a separate NMFS recovery report.

Background

Overview

When Congress passed the Endangered Species Act [16 U.S.C. 1531 et.seq.] in 1973, it set clear public policy that we were to act to prevent the destruction of nature's resource diversity. The Act established a strong leadership role for the Federal Government in the conservation of species at risk of extinction. Congress envisioned a network of international, national, State, and private organizations working together towards common goals.

The Act was first passed to provide a means to conserve the ecosystems upon which endangered and threatened species depend and to provide a program for the conservation of these species. "Conserve" was defined as the use of "all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary...." The Act further declared that the policy of Congress is for all Federal departments and agencies to seek to conserve endangered and threatened species and that they shall use their own authorities in furtherance of the purposes of the Act. Read in conjunction with the statutory definition of "conserve," Congress made it clear that all Federal agencies should promote t
recovery of listed species.

Section 4(f) of the Act, as amende
directs the Secretary of the Interior
and the Secretary of Commerce to
develop and implement recovery
plans for species of animals and
plants listed as endangered or threa
ened unless such plans will not pro
mote the conservation of such
species. The Fish and Wildlife
Service (Service) and the National
Marine Fisheries Service have bee
delegated the responsibility of adm
istering the Act. The National Mar
Fisheries Service is generally resp
sible for most marine species (exce
birds), and the Service is generally
responsible for birds and terrestria
and freshwater species. Exceptions
include the West Indian manatee, s
turtles (on land), and sea otters,
which are under the Service's juris
diction.

Fundamentally, the Endangered
Species Act is habitat-oriented. It
seeks to conserve "the ecosystems
upon which endangered species an
threatened species depend." This o
entation has been embraced by the
Service in its increased efforts to a
dress listing and recovery on a mul
species, ecosystem-wide basis
whenever possible. There is always
danger that excessive focus on the
needs of single species will result i

Left to Right: John F. Turner, Director of the U.S. Fish and Wildlife Service; Constance Harriman, Assistant Secretary of the Interior for Fish and Wildlife and Parks; Jim Range, Chairman of the National Fish and Wildlife Foundation; and George Archibald of the International Crane Foundation (ICF) examine a whooping crane at the Patuxent Wildlife Research Center in Laurel, Maryland, prior to its transfer to the ICF facility in Baraboo, Wisconsin.

unintended disruption of natural systems and a long-term loss of diversity.

Coordination among Federal, State, and local agencies, academic researchers, conservation organizations, private individuals, and major land users is perhaps the most essential ingredient for the development and implementation of an effective recovery program. In its role as coordinator of the recovery process, the Service emphasizes cooperation and teamwork among all involved parties.

Section 7 of the Endangered Species Act directs all Federal agencies to employ their authorities in furthering the purposes of the Act and to ensure that their actions do not jeopardize the continued existence of listed species or adversely modify their critical habitat. This provision is particularly significant for Federal land-managing agencies, many of whom exercise direct control over the habitat of many listed and candidate species.

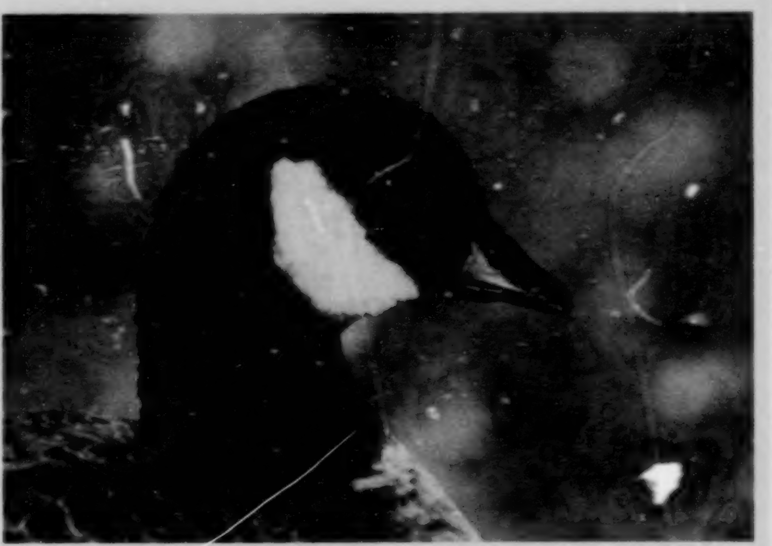
Section 10 of the Endangered Species Act allows the Fish and Wildlife Service to grant permits for any taking of listed species otherwise prohibited by section 9(a)(1)(B) if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. The Fish and Wildlife Service's ability to grant authorizations for incidental take of listed animals has been a useful tool for resolving private development conflicts with listed species. Often, as with the Stephens' kangaroo rat and desert tortoise, the conservation actions gained through Section 10 support the recovery of the species through acquisition and/or consolidation of habitats (in a manner consistent with the principles of conservation biology) that also serve to stabilize the species' decline.

While reclassifications and delistings demonstrate that there can be successes in recovery, removal from the list is not a reasonable goal for all endangered species. Primary recovery efforts generally aim at stabilizing or reversing deterioration of a species' habitat or decline in its numbers and then restoring it to a condition in which it is likely to survive over the long-term. A more realistic measure of the Service's recovery efforts than the number of species delisted is probably the proportion of listed species whose status has been stabilized, particularly among species that are habitat-limited and thus more vulnerable to changes in their environment. Maintenance of remaining populations of listed species and prevention of their extinction is a basic objective of the program. The goals of the Endangered Species Act are the conservation of unique life-forms and the natural systems upon which they depend. An evaluation of its effectiveness should be based, in large measure, on the degree to which species and populations of organisms and the ecological relationships that connect and support them, collectively referred to as biodiversity, are being maintained or degraded. Much attention has been focused in recent years on the need to better understand and protect the planet's biodiversity; endangered species, as non-regenerable elements of this system, are an essential ingredient in any program directed at biodiversity conservation.

Recovery Successes

Some endangered species recovery successes have been well publicized, such as the comeback of the bald eagle and the peregrine falcon, the successful reintroduction of the red wolf into the Southeast, and the reclassification of the American alligator from cation of the American alligator from endangered to threatened by similarity of appearance only. Other species, however, have also been brought back from critically low numbers.

The Aleutian Canada goose (*Branta canadensis leucopareia*) was once widespread throughout the Aleutian chain in Alaska and the Bering Sea. The species suffered a drastic decline when commercial fox farmers introduced non-native foxes onto the islands from about 1836 to about 1930. The geese were easy prey. Only 200-300 geese were thought to remain by the time the species was listed as endangered in 1967. Originally, though nesting was believed restricted to a single small island, Buldir Island, additional remnant populations were subsequently found. Hunting and loss of wintering habitat also may have contributed to the decline of the Aleutian Canada goose. Eliminating foxes from the islands and relocating wild family groups of geese from Buldir resulted in successful reestablishment on additional islands with natural reestablishment of other islands. In the wintering grounds, a major effort was undertaken to protect the wintering flock from hunting and to preserve roosting and feeding habitat. Several key staging and wintering habitats in Oregon and California have been protected through easements and inclusion within the National Wildlife Refuge System. Other important areas have been acquired by the California State Wildlife Area and Park systems. As a result of the recovery effort in both the breeding and wintering grounds, the Aleutian Canada goose population has increased in the wild from fewer than 800 birds in 1975 to approximately 5,800 today. Surveys this past summer indicate that the endangered goose now nests on eight islands in the Aleutian chain, up from three at the start of recovery efforts. Results of the nesting surveys supported the Service's reclassification of the Aleutian Canada goose from endangered to threatened.



Smaller than the well-known Canada goose, the Aleutian Canada goose population has dramatically improved largely due to reintroduction efforts and predator control programs for the non-native arctic fox. The Fish and Wildlife Service recently downlisted the species to threatened.

A biologist tags a hawksbill sea turtle in an effort to gather more information on its movement and habitat needs. The threats facing the species include habitat destruction and commercial demand for stuffed juveniles and products made out of its shell.

Once common along the eastern seaboard and in the Midwest, the piping plover (*Charadrius melodus*) now breeds only in scattered locations on beaches, lakeshores, and sand bars on the Atlantic coast, the northern Great Lakes, and the Great Plains. Increased predation and human disturbance are thought to be the main causes of the plover's decline. Cooperative efforts among a number of agencies and private groups have been instrumental in supporting the recovery of the plover. Atlantic Coast piping plover production was up in 1990, thanks to increased habitat protection and public education. Over 700 pairs (about 60 more than last year) nested on coastal beaches.

The Gila trout, native to relatively undisturbed mountain streams in the southwestern U.S., once was a common game fish in Arizona and New

ver, deteriorating water quality and
npacts from introduced fishes elimi-
ated the Gila trout from most of its
ormer range. When it was listed as
ndangered in 1967, it survived in
nly five small New Mexico streams.
The habitat of the five populations is
ecure and biologists have restored
even other populations on protected
and. Habitat conservation played a
ital role in the recovery. Ten of the
leven streams that contain popula-
ions of this species are in designated
vilderness areas within Gila National
orest, New Mexico and Prescott
National Forest, Arizona. The species
s also benefiting from control of
on-native trouts. Recently, though, a
erious fire occurred in the area. The
ire was followed by record rainfall a
nonth later washing large amounts of
sh into two of the main streams and
lestroying two populations. As a re-
ult of this setback, the status of the
pecies is being reevaluated.

A primary goal in recovery is to stabi-
ize populations and begin to reverse
he downward trend. A major com-
nitment of time and resources is
eeded to allow that to happen.
Downlisting or reclassification of
pecies has occurred (e.g., the Arctic
eregrine falcon, the cutthroat trouts,
Greenback, Lahontan and Paiute, and
he Utah prairie dog), indicating
trides towards recovery through im-
lementation of recovery plan tasks
nd intensive management activities.

Some species that are candidates for
isting receive assistance to prevent
hem from declining to a point to
varrant listing, such as the slab-side
early mussel (*Lexintonia dolabel-
oides*) and the rough rabbit's foot
early mussel (*Quadrula cylindrica
trigillata*), which have been reintro-
uced into their historical habitat in
he Duck River in south-central
Tennessee, and the Bruneau Hot
prings snail in southwestern Idaho.

Recovery Policy

Recovery is the process by which the decline of an endangered or threatened species is arrested or reversed, and threats to its survival are neutralized, so that its long-term survival in nature can be ensured. The goal of this process is the maintenance of secure, self-sustaining wild populations of species with the minimum necessary investment of resources.

The goal of the Service's recovery program is to: (1) identify those ecosystems and organisms that face the highest degree of threat, (2) determine tasks necessary to reduce or eliminate the threats, and (3) apply the resources available to the highest priority recovery tasks. The ultimate goal is to restore listed species to a point where they are viable self-sustaining components of their ecosystem, so as to allow "delisting."

The first step in the recovery process is the development of species-specific recovery goals and the identification and ranking of species information and management needs in terms of their relative importance and timing for recovery. This information is typically set forth in a recovery plan. A recovery plan delineates, justifies, and schedules the research and management actions necessary to support recovery of a species, including those that, if successfully undertaken, are likely to permit reclassification or delisting of the species. Recovery plans are prepared to help organize species information and management needs. These plans are comprehensive documents that identify all known recovery actions for a species and associated costs by all cooperating agencies. They serve as a blueprint for private, Federal, and State interagency cooperation in the implementation of recovery actions. A recovery plan is a document that sets forth the information base and management needs to allow the species a chance at recovery so that protection under the Endangered Species Act may no longer be required. Ecosystem-based recovery plans have been prepared to address multiple listed species recovery needs in a single ecosystem. Examples include the Ash Meadows Recovery Plan (5 animals and 7 plants), the Maui-Molokai Forest Birds Plan (7 species), and the California Channel Island Species Plan (4 plants and 3 animals).

The recovery planning process provides for public participation to enhance coordination and acceptance, which are vital to species' survival and eventual recovery. The Service recognizes the need to develop recovery plans for listed species and has increased efforts in this area, particularly by increasing the number of multi-species recovery plans, coordinating plan preparation, and identifying plans where other conservation agencies can participate in order to accelerate critical recovery task implementation. Not all species, however, will have recovery plans associated with their management. Some listed species, such as, the Little Kern golden trout, already have recovery objectives outlined in State management plans that, in effect, double as a recovery plan. The Service uses the plans in lieu of actual recovery plans. Other species, such as Bachman's warbler and Scioto madtom, are believed to be extinct; therefore, until representatives of these species are found in the wild, recovery plan preparation is curtailed.

The Endangered Species Act Amendments of 1988

The salient points of the 1988 Amendments as they relate to recovery planning and implementation are discussed below.

1. Public Review of Recovery Plans

Section 4(f) of the amended Act requires public review of all new or revised recovery plans prior to approval. The intent is to inform the public, promote public involvement in the recovery planning process, and increase the information available to all involved Federal agencies. The public participates in this activity by reviewing and commenting on the plans and by discussing issues at public meetings.

2. Recovery Plan Status Report

Section 4(f) of the Act was also amended to require the Service to report every 2 years to Congress on the preparation and implementation of recovery plans and on the status of each listed species with a recovery plan. The intent is to: (1) measure progress in developing and implementing recovery plans, and (2) provide information on the status of each listed species with a recovery plan.

3. Monitoring of Recovered Species

Section 4(g) of the Endangered Species Act was amended to require a system for monitoring (for a period of not less than 5 years) all species that have been recovered and delisted, and to provide for emergency relisting of any species that may again become in danger of extinction.

4. Section 6 Amendments

Congress recognizes that States bear much of the responsibility for managing Federally listed species and that the expertise of State conservation agencies is essential to the endangered species program. Section 6 of the Act was amended to clarify that States may use Section 6 grants to monitor the status of recovered (delisted) species and Notice of Review Category 1 and 2 candidate species. Priorities for Section 6 allocations still remain as: (1) implementation of recovery actions, (2) candidate monitoring, and (3) monitoring of recovered species.

Although monitoring candidate species is not directly related to recovery, it does provide an opportunity for Federal and State agencies to conduct prelisting habitat protection and management actions, and ensures that species awaiting listing are not lost through inattention to their status.

Biologists seining for spotfin chub in North Carolina as part of a cooperative project involving the states of North Carolina and Tennessee and two Federal agencies, the Fish and Wildlife Service and the National Park Service.

5. Annual Reporting of Recovery Expenditures

A new section (18) of the Act requires an annual reporting, on a species-by-species basis, of all "reasonably identifiable" Federal or State expenditures made primarily for the conservation of endangered or threatened species pursuant to the Act.

6. Recovery Plan Requirements

In the 1988 amendments, Congress made it clear that a recovery plan is to be an action-oriented document. There are four primary topic areas that must be addressed in every recovery plan.

- To the maximum extent feasible, a recovery plan must identify site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species. Action-oriented tasks designed to achieve specific recovery goals are appropriate.
- A recovery plan must estimate the time frame required for accomplishing recovery, **assuming that sufficient funds are provided and in accordance with the schedule in the plan**. Estimates of time to accomplish recovery must be based on known biological factors and a determination of the likelihood that other management programs, including regulatory and law enforcement programs, might facilitate or detract from task accomplishment. If they are uncertain, the nature of the uncertainty must be discussed in the plan. If unknown, time frames for recovery tasks that will make it practical to outline tasks and timeframes in future plan revisions must be discussed.
- A recovery plan must estimate the cost of complete recovery of the species. If the estimate is uncertain, the nature of the uncertainty must be discussed in the plan. In the past, some recovery plans have given only the Service's recovery costs. However, Congress now requires that all recovery plans estimate the total cost for all Federal and State agencies and private organizations involved.
- A recovery plan must set forth precise, measurable criteria and/or identify research needs that will allow the Service and others to objectively determine when recovery has been achieved (when it is, in fact, achievable).

Endangered Species Recovery Appropriations

Funding authorizations by Congress to support the Service's recovery program have increased since the 1988 amendments. Funds appropriated for fiscal years 1989 and 1990 along with designated Full-Time Equivalent (FTE) positions for recovery efforts are shown below.

Fiscal Year (FY) 1989—
$ 8,408,000/71 FTE's

Fiscal Year (FY) 1990—
$10,608,000/85 FTE's

The totals represent the combination of both the President's recommended budget and the additional appropriation agreed upon by the Congress. During the appropriations bill resolution, specific recovery activities were directed by the Congress within the additional amount provided (through the House Report, Senate Report, and/or Conference Report), affecting the Service's flexibility in recovery priority application. Congressional Directives identified for FY 89 and FY 90 are as follows:

Fiscal Year 1989

$80,000 Enhance grizzly bear activities

$100,000 Red wolf captive breeding program at the Point Defiance Zoo and Aquarium, Tacoma, Washington

$2,000,000 For high priority species, including: red, eastern timber, and northern Rocky Mountain wolves, the Aleutian Canada goose, the Puerto Rican parrot, the peregrine falcon, the Mount Graham red squirrel, the Bruneau Hot Springs snail, the Hawaiian forest birds, the southern sea otter, the whooping crane, the black-footed ferret, the Florida panther, the grizzly bear, the Attwater's prairie chicken, various sea turtles, and the manatee.

$300,000 Support to the Peregrine Fund, Inc. and survey and monitoring of the St. Anthony's dunes tiger beetle.

A Fish and Wildlife Service biologist prepares a red wolf for release into Alligator River National Wildlife Refuge.

Fiscal Year 1990

$124,000 Increase above the 1989 level for the Upper Colorado River Basin plan.

$1,500,000 Restoration of the proposed reductions for activities related to specific species.

$250,000 Red wolf recovery activities.

$400,000 Bruneau Hot Springs snail.

$300,000 Peregrine falcon recovery under the auspices of The Peregrine Fund, Inc.

$750,000 High priority species recovery, including: manatee, sea turtles, and Hawaiian birds.

$800,000 Spotted owl recovery.

Non-specific Includes grizzly bear and wolf recovery activities.

Recent audits by the Office of the Inspector General, U.S. Department of the Interior, identified the potential recovery costs for currently listed species to be approximately $4.6 billion dollars (includes private, Federal, and State costs required for endangered species recovery actions).

Fish and Wildlife Service biologists are engaging in recovery activities for the endangered Malheur wire-lettuce in Oregon.

Service Guidance and Endangered Species Act Implementation

Recovery Priority System

The Service outlined "Endangered and Threatened Species Listing and Recovery Priority Guidelines" (Guidelines) in the *Federal Register* dated September 21, 1983. The Guidelines set recovery plan development and implementation priorities by combining immediacy of threats to a species' survival with the species' "recovery potential." The priority systems are based on an analysis of such factors as degree and immediacy of threat faced by species, needs for further information, and species' recovery potentials.

The Species Recovery Priority System uses the criteria of (1) degree of threat, (2) recoverability, and (3) taxonomy [level of genetic diversity]. By applying these criteria, all listed species are assigned a species priority number of 1 through 18. A fourth factor, conflict, is a supplementary element in determining what actions are to be implemented for the recovery of a species. In addition, the fourth factor gives priority, within each category, in the preparation of recovery plans to those species that are, or may be, in conflict with construction or other development projects. Thus, the species retains its numerical rank and acquires the letter designation of "C," indicating conflict (1C-18C). The Service's Recovery Priority System is outlined in Table 1.

In addition to the species priority numbers, consideration is given to the importance of each recovery task. Priorities (1-3) are assigned to recovery tasks based on the following criteria:

> Priority 1 task—necessary to prevent species extinction
>
> Priority 2 task—necessary to maintain species status
>
> Priority 3 task—necessary to achieve species recovery

Combination of the two systems results in a two-tiered priority system (species recovery number-task priority number) which serves as a guide to distribute the program resources equitably for all listed species. Funds are allocated for recovery tasks according to species and task priorities. Implementation of this priority system ensures that limited resources can be focused on areas of greatest needs.

In concept, resources should be allocated first to accomplishing priority-1 recovery tasks for species with a recovery priority number of 1 and last to priority-3 tasks for a species with recovery priority of 18 (lowest priority delineated in the current system). Actual funding allocations, however, may not follow this formula strictly in all cases. Some otherwise low priority species that need only one or two low priority tasks to complete recovery might receive resources to expedite their downlisting or delisting.

In practice, Congress sometimes mandates that funds be spent on species or tasks that would otherwise not yet be funded by a strict application of the two priority systems. Also, the Service must often be flexible enough to take advantage of special opportunities provided by shifting social, political, or economic circumstances. Therefore, the two formal priority systems, used in tandem, serve as a guide rather than a mold to which all actions must conform. The Service must be allowed to exercise management discretion in order to achieve the greatest conservation benefits for resources expended. Other agencies, groups, and individuals can and do become involved in the coordinated recovery effort.

Table 1. Recovery Priority System*

Degree of Threat	*Recovery Potential*	*Taxonomy*	*Priority*	*Conflict*
High	High	Monotypic genus	1	1C 1
	High	Species	2	2C 2
	High	Subspecies	3	3C 3
	Low	Monotypic genus	4	4C 4
	Low	Species	5	5C 5
	Low	Subspecies	6	6C 6
Moderate	High	Monotypic genus	7	7C 7
	High	Species	8	8C 8
	High	Subspecies	9	9C 9
	Low	Monotypic genus	10	10C 10
	Low	Species	11	11C 11
	Low	Subspecies	12	12C 12
Low	High	Monotypic genus	13	13C 13
	High	Species	14	14C 14
	High	Subspecies	15	15C 15
	Low	Monotypic genus	16	16C 16
	Low	Species	17	17C 17
	Low	Subspecies	18	18C 18

As Published Sept. 21, 1983 [43 FR 43098]

Recovered Species Monitoring Program

A species is considered "recovered" when it no longer needs protection under the Endangered Species Act. The factors that initially led to its listing must be remedied so as to no longer jeopardize the species continued survival. Recovery is much more complex than just increasing the species' numbers. Legal as well as biological factors are relevant to species recovery. Recovery of many species requires concerted efforts on the part of Federal and State authorities, as well as private parties, to enact laws and regulations and to reach agreements to protect listed species independent of the Endangered Species Act. Without the stringent limitation on activities adversely affecting listed species that protection under the Act provides, "biologically" recovered species may still need the Act's protection in order to sustain population levels. Only when adequate legal mechanisms independent of the Act are implemented to manage a listed species whose populations have recovered can the species be truly said to no longer require Endangered Species Act protection and thus be considered for delisting.

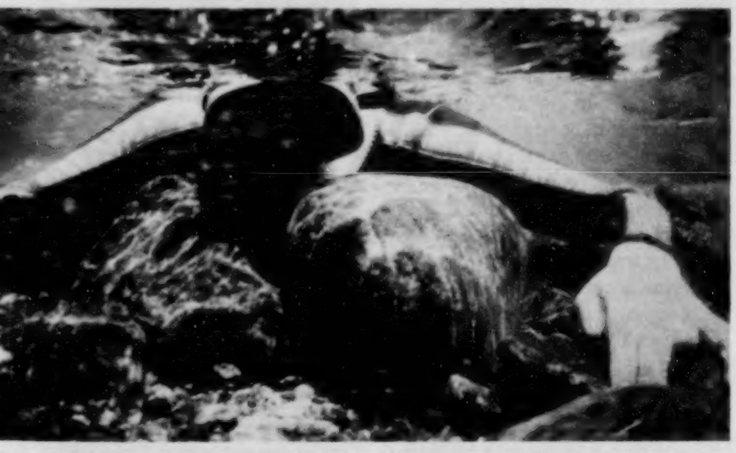
The 1988 amendments to the Act recognized this potential conflict involving recovered species and removal from the protective oversight of the Act. Section 4 of the Act was amended by adding a provision that requires the Secretary, acting in cooperation with State governments, to implement a system for monitoring recovered species for at least five years after they are removed from the protected lists. In the event of a "significant risk to the well being" of any such species, the Secretary must use his emergency authority under section 4(b)(7) to relist the species.

Endangered Species Act (1988 Amendments) Compliance

The Service issued internal guidance for compliance with the 1988 amendments to the Endangered Species Act on May 25, 1989. The guidance included categories for tracking Service expenditures for recovery. The Service tracks and reports on listed species in an existing database maintained in-house. A new data field has been added to that database to track species by status categories (e.g., Improving, Stable, Declining, Unknown, Extinct).

Endangered Species Expenditures Report

Twenty-eight Federal agencies were contacted for an accounting of the recovery expenditures by species during FY 89. Through the International Association of Fish and Wildlife Agencies, the Service compiled State expenditures for endangered species expenditures during FY 89. All of the information was compiled into a report to Congress entitled "Federal and State Endangered Species Expenditures," dated January 1990. The second annual report of endangered species expenditures, dated January 1991, presented expenditures of the Service, other Federal agencies, and State agencies for the conservation of endangered and threatened species.



An aquatic biologist collects yellowfin madtom eggs and fry in Tennessee for labora-
ory propagation and research as part of a joint Federal/State effort which reestab-
ished a population of the species in Virginia.

During 1990, seven California condor chicks were born in captivity. Due to the success of the Fish and Wildlife Service's captive breeding effort, California condors may be released into the wild as early as 1991.

Service Guidance—Recovery Program Implementation

The Service's "Policy and Guidelines for Planning and Coordinating Recovery of Endangered and Threatened Species," was revised and distributed Servicewide during May 1990. The revision addresses the requirements of the 1988 Amendments to the Endangered Species Act, the General Accounting Office's December 1988 report, "Endangered Species Management: Improvements Could Enhance Recovery Program," and the desire of the Service to make the guidance more useful and consistent with current policy.

Listed Species Recovery Status Report

Overview

The Fish and Wildlife Service is comprised of a headquarters operation in Washington, D.C., seven operational Regional Offices that provide geographic coverage of the United States and Trust Territories, and an eighth Regional Office (Research and Development), that deals with foreign species. A map outlining the Regional boundaries is attached.

The Service's Washington Office maintains a database indicating lead Regions, by species, for listing (including candidate monitoring and assessment) and recovery. In most cases, a single Region functions as lead for all activities regarding a species. In *exceptional* circumstances, leads for a given species may be divided among Regions so that, for example, one Region would have the lead for listing a species and another Region would have the lead for recovery, or regional populations would be treated separately (e.g. peregrine falcon, gray wolf), with leads assigned to more than one Region for the recovery effort. Recovery "entities" are addressed in this report. Though the gray wolf is listed as a single species, three separate recovery entities exist: Eastern timber wolf, Northern Rocky Mountain wolf, and Mexican gray wolf. Therefore, the gray wolf is counted as three populations, with three distinctly separate plans. The roseate tern is listed as both endangered and threatened in different parts of its range. The tern has a single recovery plan to address the species recovery needs, thus one species and one plan. The piping plover is listed as both endangered and threatened in different parts of its range, but yet has distinct recovery entities. The Interior/Great Lakes entity is both threatened and endangered in different areas, but is covered in one recovery plan. The Atlantic coast entity is threatened and covered by a separate plan. The plover is counted as two distinct entities, with two plans. The brown pelican is listed on the Pacific coast and in the Gulf area; therefore, two distinct recovery entities result in it being counted as two, with two plans. The bald eagle is listed as both endangered and threatened in different parts of its range. It does have five recovery plans, but the areas are separated geographically, not biologically. The bald eagle is counted as one, with one plan.

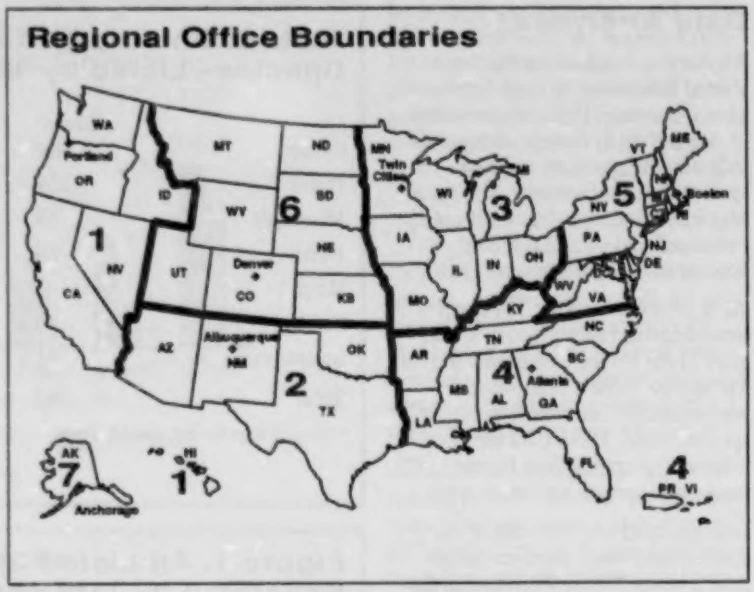
The **Species Status Report** is divided into four major sections. Appendices presenting each section are explained below. The Lead Region is listed for each species. Coordination among Regions regard-

species status occurs when
own ranges overlap Regional
undaries.

pendix I

pendix I addresses the status of
h species with an approved recov-
plan. Each species' status is iden-
ed as Improving, Stable, Declining,
known, or Extinct. "Improving"
icates those species known to be
reasing in numbers and/or whose
eats to recovery are lessening in
wild, as well as those species oc-
ring only in captive propagation
grams but still increasing in num-
s (e.g., California condor, Mexican
y wolf). "Unknown" describes
se species for which additional
vey work is needed to accurately
luate their status. A species status
"Extinct" describes those species
ieved to be extinct, but have yet to
delisted (e.g., bridled white-eye,
ercled-blossom pearly mussel). A
st of factors including, but not lim-
d to, the introduction of exotic
cies, water projects, urban devel-
ment and encroachment, research,
d acquisition, cooperative manage-
nt efforts, etc., affect a species'
tus.

ck footed ferrets are breeding readily
captivity. The Service anticipates rein-
duction into the wild in the near future.



Regional Office Boundaries

Appendix II

Appendix II outlines the status of development and implementation of recovery plans for all species occurring in the United States and/or Trust Territories. Data for each listed species includes: (1) whether or not the species has an approved recovery plan and, if not, whether one will be prepared; (2) the stage of the recovery plan, and (3) the percentage of the species' recovery objective(s) that have been met [an integer of 1-4 to represent <25%, 26-50%, 51-75%, and 76-100% of recovery objective(s) achieved].

Appendix III

Appendix III of this report indexes all listed species by State(s) and/or Trust Territory of occurrence. Each State and/or territory is listed individually with listed species cross-referenced with a **"Species Account Number."** The Species Account Number directly relates to the Individual Species Recovery Report in Appendix IV. The reader can obtain more detailed information on a specific species by looking up the Species Account Number in Appendix IV (presented in ascending order).

Appendix IV

Appendix IV provides individual species recovery progress reports for all listed species occurring in the United States and/or Trust Territories. An index of the species, listed alphabetically by common name, is at the end of Appendix IV. A centralized database is maintained by the Service's Washington Office. Each Regional Office is responsible for submitting a Species Status Report on each listed species for which it has lead responsibility.

This year's report includes all species listed as of **October 1, 1990.** Recovery plan information is also current as of **October 1, 1990.** Data are outlined for species occurring in the United States and/or Trust Territories only. *No foreign species are reported.* The date of listing for each species is the date the rule was published in the *Federal Register.* The effective date of the rule is usually thirty days succeeding publication in the *Federal Register.*

Data Analyses

All listed species occurring in the United States and/or Trust Territories, as of October 1, 1990, are presented in Appendix III. A map is included, indicating the number of listed species by State/Territory. The numbers identified omit "similarity of appearance" and some extirpated species from the totals identified.

As of October 1, 1990, 581 species were listed as endangered or threatened in the United States and/or Trust Territories. Table 2 presents the percentage, by taxonomic group, of species listed. These data are also presented graphically in Figure 1. All taxonomic groups are represented.

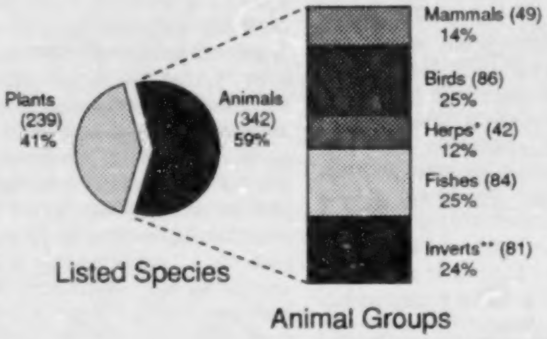
Four hundred and fifty-two of the species have been listed for longer than 3 years. Figure 2 represents the taxonomic breakdown of species listings. Species listed in the last three years have been dominated by plants (58%). For the most part, species listed less than three years do not yet have final approved recovery plans. Many do, however, have plans in some stage of development. Recovery outlines are developed within 60 days of publication of the final rule listing a species and are submitted to the Director to be used as a guide for activities until recovery plans are developed.

Table 2. Endangered and Threatened Species—Listed by Taxonomic Group

Group	*Number Listed*	*Percentage*
Plants	239	41%
Mammals	49	8%
Birds	86	15%
Herps*	42	7%
Fishes	84	15%
Invertebrates	81	14%
Total	581	100%

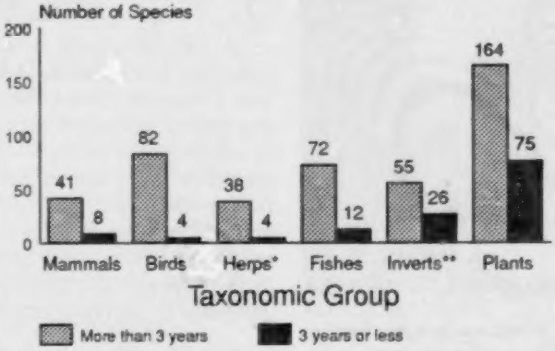
* Herps = Reptiles and Amphibians

Figure 1. All Listed Species Separated by Taxonomic Group



*Amphibians and Reptiles **Invertebrates

Figure 2. Length of Time on List Separated by Taxonomic Group



*Amphibians and Reptiles **Invertebrates

Figure 3. Recovery Priority Separated by Taxonomic Group

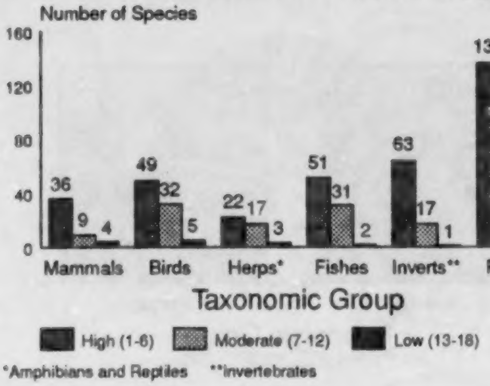


Figure 4. Recovery Priority With and Without Conflicts

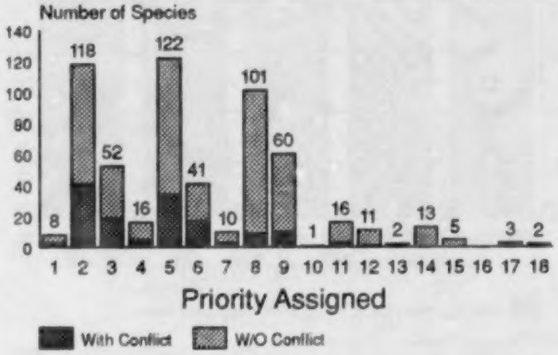


Table 3. Listed Species With and Without Approved Recovery Plans – Taxonomic Distribution

Group	*Number of Species*	*With Plans*	*Without Plans*
Plants	239	119	120
Mammals	49	29	20
Birds	86	71	15
Herps	42	30	12
Fishes	84	49	35
Invertebrates	81	54	27
Total	581	352	229

Individual species recovery priorities are assigned using the Service's published guidelines (based on recovery potential, degree of threat, and taxonomic distinctness). Figure 3 presents the assigned recovery priority numbers by taxonomic group. Sixty-one percent of the species are assigned high recovery priority numbers, signifying an imminence of extinction for nearly two-thirds of the listed species. Approximately 35% are assigned moderate recovery priority numbers and 4% are assigned low numbers. High priorities are assigned across all taxonomic groups with no bias towards any taxonomic group.

An additional designation "C" is appended to those species recovery priority numbers where a known threat or "conflict" exists. Figure 4 provides a graphic representation of the number of species where conflict with actions other than the species recovery exist. Approximately 25% of listed species have possible conflicts with development projects or other forms of economic activity. The majority of listed species are not in conflict with other activities. Where conflicts are identified, priority in resource allocation is applied to conflict resolution.

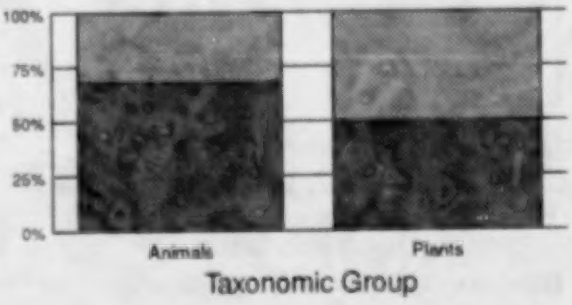
Table 3 outlines the taxonomic distribution of species with and without approved recovery plans.

Of the 581 U.S. listed species, 352 (61%) have approved recovery plans as of October 1, 1990. Figure 5 presents a breakdown, by taxonomic group, of the percentage of all species that currently have approved recovery plans. Most of the remaining species, particularly those that have been listed for more than three years and still do not have approved plans, are currently in some stage of recovery plan development. Others are "pending", indicating that recovery planning will be initiated when resource allocations allow for it. A small percentage of species will not have plans developed for one reason or another (e.g., Tinian monarch, Bachman's warbler, Little Kern golden trout, etc.). Specific information on the species for which recovery plans will not be prepared is in Appendix IV.

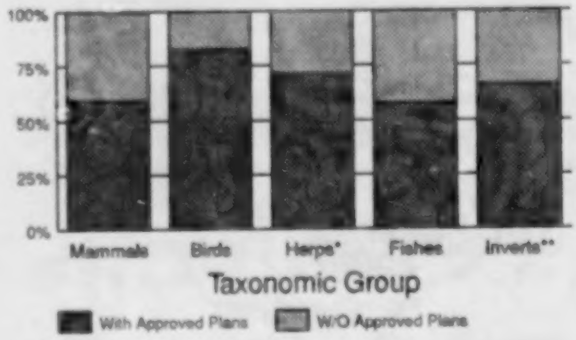
Table 4 outlines, by taxonomic group, the recovery plan status for listed species. The "Pending" column constitutes the actual recovery plan backlog.

Eighty-three percent of listed species have either an approved recovery plan or one that is in some stage of development (Approved and Draft plans). Eighteen (3%) of the species will not have recovery plans prepared. Of the 81 species with recovery plans "pending," that is, planned but not yet initiated, 41 have been listed less than three years. The remaining forty (7%) of the species that warrant having recovery plans developed, but have yet to have a plan initiated, have been listed longer than three years. The 7% constitutes the actual recovery plan backlog in the Fish and Wildlife Service. Plans are under way to emphasize multi-species recovery planning, where appropriate, to help address the backlog, as well as to focus on ecosystem recovery efforts for groups of species.

Figure 5.
Listed Species With and Without Approved Recovery Plans



Listed Animal Species With and Without Approved Recovery Plans

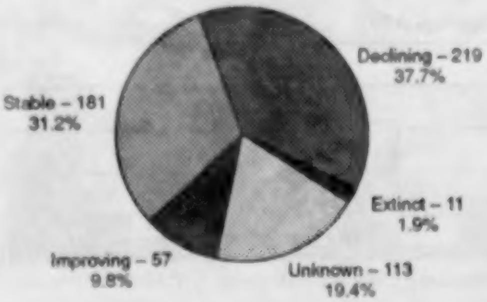


*Amphibians and Reptiles **Invertebrates

Table 4. Listed Species Recovery Plan Status

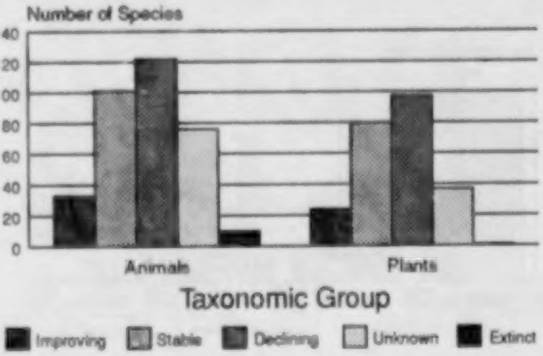
Group	*Approved*	*Draft*	*Pending*	*NA*
Plants	119	71	44	5
Mammals	29	14	5	1
Birds	71	4	7	4
Herps*	30	7	3	2
Fishes	49	23	9	3
Invertebrates	54	11	13	3
Total	352 (61%)	130 (22%)	81 (14%)	18 (3%)

Figure 6. Recovery Status All Listed Species

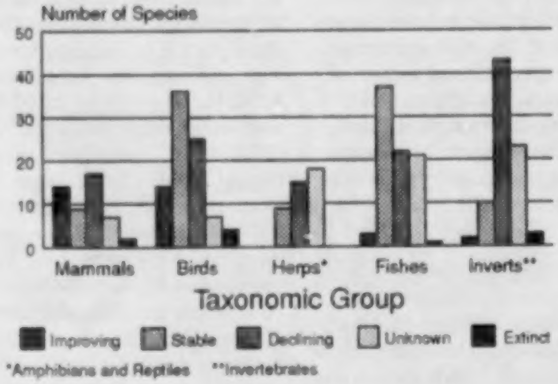


(581 species total)

Figure 7.
Recovery Status of Listed Species Separated by Taxonomic Group



Recovery Status of Animal Species Separated by Taxonomic Group



*Amphibians and Reptiles **Invertebrates

All species are declining at the time of listing under the Endangered Species Act. A major goal is to reverse the downward trend of all listed species. Even though species are afforded protection under the Endangered Species Act, the status of a number of those species is still critical. Ten percent are considered improving and 31% are considered stable as a direct result of recovery efforts, but a sizeable number (38%) are still considered declining and 2% are believed extinct. The status of 19% of the listed species is unknown; further research and survey work are needed to determine each "unknown" species' overall status. (See Figure 6.)

Figure 7 indicates the recovery status, as separated by taxonomic group, of listed species. Most of the species considered to be improving are mammals, birds, or plants. A significant majority of them are recovering from very low numbers, with the benefit of intensive, hands-on management. Bird and fish species represent the taxa considered to be the most stable. The unknown component is most pronounced in invertebrates, reflecting a need for additional studies. Three-fourths of the prominent declining status of invertebrates are freshwater mussels.

Recovery is a major part of the Service's endangered species management program. Species with approved recovery plans have a higher percentage of "improving" status designations than those without plans (14% versus 3%). Implementation of recovery plan tasks provide significant gains towards positive species recovery efforts. The most significant recovery status difference between the species with and without approved recovery plans is the number of "unknowns" for those species without recovery plans (25% "unknowns" without plans versus 16% with plans). Recovery plans also outline research efforts needed to assess a species' status and begin the downward trend reversal. (See Figure 8.) Seven species with approved recovery plans are believed to be extinct. Specific information on each of the seven species is contained in Appendix IV.

The Service has placed increased emphasis on recovery planning. A process has been developed to reduce the backlog of species without recovery plans. Target timeframes have been established to guide the development of draft and final plan preparation.

Primary recovery objectives include delisting, downlisting, or protection of existing populations for a specific time period or for the foreseeable future. Tasks are identified in each species recovery plan to satisfy the recovery criteria aimed at achievement of the recovery objective. Percentage of recovery objectives achieved are used as a measure of progress towards species recovery. All recently listed species fall in Level 1 (< 25% of objectives achieved). The number of listed species in Level 1 can be expected to increase if listing is accelerated by multi-species/ecosystem listings.

Examples of Level 4 (> 75% of recovery objectives achieved) include the Columbian white-tailed deer, Bald eagle, American peregrine falcon, Pahrump killifish, Socorro isopod, and Maguire daisy.

Figure 8. Recovery Status Species With and Without Recovery Plans

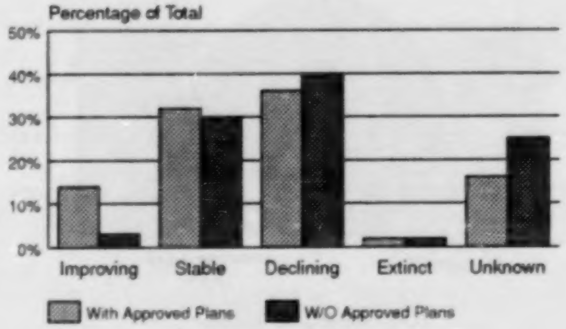


Figure 9. Recovery Objectives Achieved All Listed Species

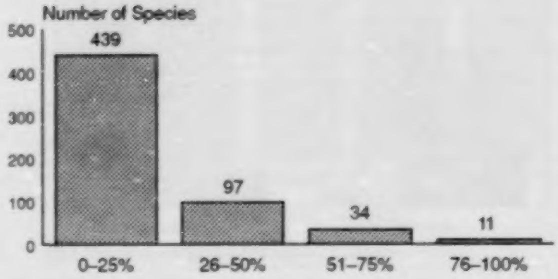
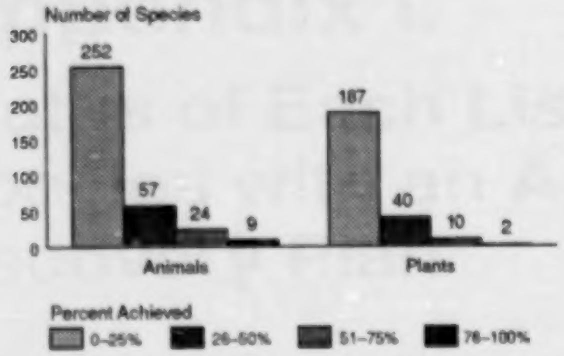


Figure 9 shows the percentage of recovery objectives achieved for all listed species. Four hundred thirty-nine of the 581 species (76%) have less than 25% of their recovery objectives achieved. The high percentage includes all species listed within the last three years. In addition, it indicates the long-term nature of listed species recovery. Figure 10 presents the percentage of recovery objectives achieved, as separated by taxonomic group.

Both an overall trend towards recovery and the time dimensions of that trend are evident in Figure 11, which plots the relationship between the time (in years) since each species was listed and the percentage of species listed each year that are considered declining. The calculation was made in October 1990, so each bar shown represents the specified number of fiscal year(s) of domestic species listings, counting back from October 1, 1990. For example, of the 37 U.S. species listed last fiscal year, 29 (78%) are still considered to be declining. Species listed longer appear to have a better chance of becoming stable or improving. A noteworthy exception to the trend is the 33 species that were listed 14 years ago, 20 of which are freshwater mussels. Almost all the mussels are still declining due to competition from

Figure 10. Recovery Objectives Achieved Separated by Taxonomic Group



Animal Recovery Objectives Achieved Separated by Taxonomic Group

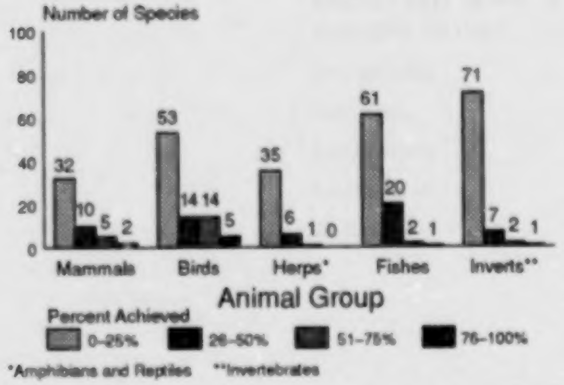
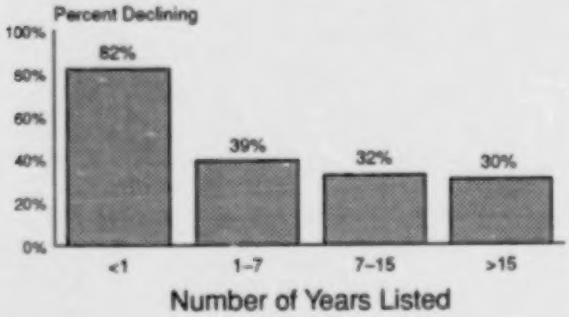


Figure 11. Fraction of Species Declining As a Function of Years Listed



introduced species, siltation, nonpoint source pollution, and water development projects.

Ultimately, conservation of all endangered species should be incorporated into a broadly based effort to maintain biodiversity, of which endangered species are an important component. Through creative partnerships, the Service will increase the involvement of private groups, State and local agencies, and other Federal agencies in the development and implementation of recovery plans and actions. Focusing more on ecosystems, thereby surpassing a species-by-species approach to recovery, will more efficiently address the long-term conservation needs of groups of species.

A commitment to endangered species recovery is needed for a long time to allow for noticeable results. Long-term planning is needed to address the program objectives. Though the timeframe involved may be perceived as long, recovery can and does happen. A serious commitment of both personnel and money is important to ensure the stabilization and recovery of important ecosystems and the long-term support of biodiversity.

Appendix I.

Status of Each Listed Species with an Approved Recovery Plan

Species status is reported with a single letter.

I=Improving

S=Stable

D=Declining

U=Unknown

E=Extinct

Species	Listed As	Lead Region	Status
MAMMALS			
Bat, gray	E	3	I
Bat, Indiana	E	3	D
Bat, Ozark big-eared	E	2	U
Bat, Virginia big-eared	E	5	I
Bear, grizzly or brown	T	6	S
Caribou, woodland	E	1	I
Cougar, eastern	E	5	E
Deer, Columbian white-tailed	E	1	I
Deer, key	E	4	D
Ferret, black-footed	E	6	I
Fox, San Joaquin kit	E	1	D
Jaguarundi (2 subspecies)	E	2	U
Manatee, West Indian (Florida)	E	4	D
Mouse, Alabama beach	E	4	I
Mouse, Choctawahatchee beach	E	4	U
Mouse, Perdido Key beach	E	4	I
Mouse, Salt marsh harvest	E	1	D
Ocelot	E	2	S
Otter, southern sea	T	1	S
Panther, Florida	E	4	S
Pronghorn, Sonoran	E	2	D
Rat, Morro Bay kangaroo	E	1	D
Squirrel, Carolina northern flying	E	4	S
Squirrel, Delmarva Peninsula fox	E	5	S
Squirrel, Virginia northern flying	E	5	S
Wolf, gray (Eastern timber)	E,T	3	I
Wolf, gray (Rocky Mountain)	E	6	I
Wolf, gray (Mexican)	E	2	I
Wolf, red	E	4	I
BIRDS			
'Akepa, Hawaii (honeycreeper)	E	1	S
'Akepa, Maui (honeycreeper)	E	1	D
'Akialoa, Kauai (honeycreeper)	E	1	U
'Akiapola'au (honeycreeper)	E	1	S
Blackbird, yellow-shouldered	E	4	S
Bobwhite, masked (quail)	E	2	I
Broadbill, Guam	E	1	U
Caracara, Audubon's (Florida) crested	T	4	S
Condor, California	E	1	I
Coot, Hawaiian (='alae-ke'oke'o)	E	1	S
Crane, Mississippi sandhill	E	4	I
Crane, whooping	E	2	I
Creeper, Hawaiian	E	1	S
Creeper, Molokai (=kakawahie)	E	1	D
Crow, Hawaiian (='alala)	E	1	D
Crow, Mariana	E	1	D

Species	Listed As	Lead Region	Status
Duck, Hawaiian (koloa)	E	1	S
Duck, Laysan	E	1	S
Eagle, bald	E,T	3	I
Falcon, American peregrine (Alaska)	E	7	I
Falcon, American peregrine (eastern)	E	5	I
Falcon, American peregrine (western)	E	1	I
Falcon, Arctic peregrine	T	7	I
Falcon, northern aplomado	E	2	U
Finch, Laysan (honeycreeper)	E	1	S
Finch, Nihoa (honeycreeper)	E	1	S
Goose, Aleutian Canada	E	7	I
Goose, Hawaiian (=nene)	E	1	D
Hawk, Hawaiian (=io)	E	1	S
Honeycreeper, crested (=‘akohekohe)	E	1	S
Jay, Florida scrub	T	4	D
Kingfisher, Guam Micronesian	E	1	S
Kite, Everglade snail	E	4	S
Millerbird, Nihoa (old world warbler)	E	1	S
Moorhen (gallinule), Hawaiian common	E	1	S
Nightjar (whip-poor-will), Puerto Rico	E	4	S
Nukupu‘u (honeycreeper)	E	1	D
‘O‘o, Kauai (= ‘O‘o ‘A‘a)	E	1	D
‘O‘u (honeycreeper)	E	1	D
Palila (honeycreeper)	E	1	S
Parrot, Puerto Rican	E	4	D
Parrotbill, Maui (honeycreeper)	E	1	S
Pelican, brown (California population)	E	1	S
Pelican, brown (Eastern population)	E	2	I
Petrel, Hawaiian dark-rumped	E	1	S
Pigeon, Puerto Rican plain	E	4	S
Plover, piping (Atlantic coastal)	T	5	S
Plover, piping (Interior)	E,T	3	D
Po‘ouli (honeycreeper)	E	1	D
Prairie-chicken, Attwater's	E	2	D
Rail, California clapper	E	1	D
Rail, Guam	E	1	S
Rail, light-footed clapper	E	1	D
Rail, Yuma clapper	E	2	S
Shearwater, Newell's Townsend's	T	1	S
Shrike, San Clemente loggerhead	E	1	D
Sparrow, Cape Sable seaside	E	4	S
Sparrow, dusky seaside	E	4	E
Sparrow, Florida grasshopper	E	4	D
Sparrow, San Clemente sage	T	1	D
Stilt, Hawaiian (=ae‘o)	E	1	S
Stork, wood	E	4	S
Tern, California least	E	1	D
Tern, least (interior population)	E	3	I

Species	Listed As	Lead Region	Status
Tern, roseate	E,T	5	S
Thrush, large Kauai	E	1	D
Thrush, Molokai (oloma'o)	E	1	D
Thrush, small Kauai (puaiohi)	E	1	S
Warbler (wood), Kirtland's	E	3	I
White-eye, bridled	E	1	E
Woodpecker, red-cockaded	E	4	D
REPTILES			
Anole, Culebra Island giant	E	4	U
Boa, Mona	T	4	U
Boa, Puerto Rican	E	4	S
Boa, Virgin Islands tree	E	4	U
Crocodile, American	E	4	U
Gecko, Monito	E	4	U
Iguana, Mona ground	T	4	S
Lizard, blunt-nosed leopard	E	1	D
Lizard, Coachella Valley fringe-toed	T	1	D
Lizard, Island night	T	1	S
Lizard, St. Croix ground	E	4	U
Rattlesnake, New Mexican ridge-nosed	T	2	U
Snake, eastern indigo	T	4	D
Snake, San Francisco garter	E	1	D
Turtle, Alabama red-bellied	E	4	U
Turtle, flattened musk	T	4	U
Turtle, green sea	E,T	2	U
Turtle, hawksbill sea (=carey)	E	2	U
Turtle, Kemp's (Atlantic) ridley sea	E	2	D
Turtle, leatherback sea	E	2	U
Turtle, loggerhead sea	T	2	D
Turtle, olive (Pacific) ridley sea	E,T	2	D
Turtle, Plymouth red-bellied	E	5	S
Turtle, ringed sawback	T	4	S
AMPHIBIANS			
Coqui, golden	T	4	D
Salamander, desert slender	E	1	U
Salamander, Red Hills	T	4	D
Salamander, San Marcos	T	2	U
Salamander, Santa Cruz long-toed	E	1	S
Toad, Houston	E	2	U
FISHES			
Cavefish, Alabama	E	4	S
Cavefish, Ozark	T	4	I
Chub, bonytail	E	6	D
Chub, Borax Lake	E	1	S
Chub, Chihuahua	T	2	S
Chub, humpback	E	6	S

Species	Listed As	Lead Region	Status
Chub, Mohave tui	E	1	D
Chub, Pahranagat roundtail	E	1	U
Chub, slender	T	4	U
Chub, spotfin	T	4	U
Cui-ui	E	1	U
Dace, Ash Meadows speckled	E	1	S
Dace, blackside	T	4	U
Dace, Kendall Warm Springs	E	6	S
Dace, Moapa	E	1	S
Darter, amber	E	4	S
Darter, bayou	T	4	S
Darter, boulder (=Elk River)	E	4	S
Darter, fountain	E	2	U
Darter, leopard	T	2	S
Darter, Maryland	E	5	D
Darter, Niangua	T	3	U
Darter, Okaloosa	E	4	D
Darter, slackwater	T	4	U
Darter, snail	T	4	U
Darter, watercress	E	4	D
Gambusia, Big Bend	E	2	S
Gambusia, Clear Creek	E	2	S
Gambusia, Pecos	E	2	S
Gambusia, San Marcos	E	2	E
Killifish, Pahrump	E	1	I
Logperch, Conasauga	E	4	S
Madtom, Smoky	E	4	S
Madtom, yellowfin	T	4	U
Pupfish, Ash Meadows Amargosa	E	1	S
Pupfish, Comanche Springs	E	2	D
Pupfish, Devil's Hole	E	1	S
Pupfish, Leon Springs	E	2	S
Pupfish, Owens	E	1	S
Pupfish, Warm Springs	E	1	S
Shiner, Cape Fear	E	4	U
Squawfish, Colorado	E	6	S
Stickleback, unarmored threespine	E	1	S
Topminnow, Gila	E	2	D
Trout, Apache	T	2	D
Trout, Gila	E	2	D
Trout, greenback cutthroat	T	6	I
Trout, Paiute cutthroat	T	1	D
Woundfin	E	6	D
INVERTEBRATES—SNAILS			
Snail, Chittenango ovate amber	T	5	D
Snail, flat-spired three-toothed land	T	5	S
Snail, Iowa Pleistocene	E	3	U

Species	Listed As	Lead Region	Status
Snail, Noonday	T	4	U
Snail, painted snake coiled forest	T	4	U
Snail, Stock Island	T	4	D
Snail, Virginia fringed mountain	E	5	S
INVERTEBRATES—CLAMS			
Mussel, Curtus'	E	4	D
Mussel, Judge Tait's	E	4	D
Mussel, Marshall's	E	4	D
Mussel, penitent	E	4	D
Pearly mussel, Alabama lamp	E	4	D
Pearly mussel, Appalachain monkeyface	E	4	D
Pearly mussel, birdwing	E	4	D
Pearly mussel, Cumberland bean	E	4	D
Pearly mussel, Cumberland monkeyface	E	4	D
Pearly mussel, Curtis'	E	3	D
Pearly mussel, dromedary	E	4	D
Pearly mussel, green-blossom	E	4	D
Pearly mussel, Higgins' eye	E	3	U
Pearly mussel, little-wing	E	4	D
Pearly mussel, orange-footed	E	4	D
Pearly mussel, pale lilliput	E	4	D
Pearly mussel, pink mucket	E	4	D
Pearly mussel, tubercled-blossom	E	4	E
Pearly mussel, turgid-blossum	E	4	E
Pearly mussel, white cat's paw	E	3	U
Pearly mussel, white wartyback	E	4	D
Pearly mussel, yellow-blossom	E	4	E
Pigtoe, fine-rayed	E	4	D
Pigtoe, rough	E	4	D
Pigtoe, shiny	E	4	D
Pocketbook, fat	E	4	I
Riffle shell, tan	E	4	D
Shell, stirrup	E	4	D
Spinymussel, James River (=Virginia)	E	5	D
Spinymussel, Tar River	E	4	D
INVERTEBRATES—CRUSTACEANS			
Crayfish, cave	E	4	S
Crayfish, Nashville	E	4	U
Isopod, Socorro	E	2	I
Shrimp, Kentucky Cave	E	4	U
INVERTEBRATES—INSECTS			
Beetle, delta green ground	T	1	U
Beetle, valley elderberry longhorn	T	1	U
Butterfly, El Segundo blue	E	1	U
Butterfly, Lange's metalmark	E	1	S
Butterfly, lotis blue	E	1	U

Species	Listed As	Lead Region	Status
Butterfly, mission blue	E	1	S
Butterfly, Oregon silverspot	T	1	D
Butterfly, Palos Verde blue	E	1	D
Butterfly, San Bruno elfin	E	1	S
Butterfly, Schaus swallowtail	E	4	D
Butterfly, Smith's blue	E	1	D
Moth, Kern primrose sphinx	T	1	U
Naucorid, Ash Meadows	T	1	U
PLANTS			
Arrowhead, bunched	E	4	D
Aster, decurrent false	T	3	I
Aster, Florida golden	E	4	D
Barberry, Truckee	E	1	S
Bear-poppy, dwarf	E	6	D
Beauty, Harper's	E	4	I
Birch, Virginia round-leaf	E	5	I
Bird's-beak, salt marsh	E	1	U
Bladder-pod, Missouri	E	3	I
Blazingstar, Ash Meadows	T	1	S
Blazingstar, Heller's	T	4	U
Blazingstar, scrub	E	4	D
Bonamia, Florida	T	4	D
Boxwood, Vahl's	E	4	D
Broom, San Clemente Island	E	1	I
Bush-clover, prairie	T	3	I
Bush-mallow, San Clemente Island	E	1	I
Cactus, black lace	E	2	D
Cactus, Brady pincushion	E	2	U
Cactus, bunched cory	T	2	D
Cactus, Key tree	E	4	S
Cactus, Knowlton	E	2	S
Cactus, Kuenzler hedgehog	E	2	S
Cactus, Lee pincushion	T	2	S
Cactus, Lloyd's Mariposa	T	2	D
Cactus, Mesa Verde	T	2	S
Cactus, Nellie cory	E	2	D
Cactus, Nichol's Turk's head	E	2	U
Cactus, Peebles Navajo	E	2	U
Cactus, Siler pincushion	E	2	U
Cactus, Sneed pincushion	E	2	D
Cactus, spineless hedgehog	E	6	I
Cactus, Tobusch fishhook	E	2	U
Cactus, Uinta Basin hookless	T	6	S
Cactus, Wright fishhook	E	6	S
Centaury, spring-loving	T	1	S
Cinquefoil, Robbins'	E	5	S
Clover, running buffalo	E	3	I

Species	Listed As	Lead Region	Status
Coneflower, Tennessee purple	E	4	S
Daisy, lakeside	T	3	S
Dawn-flower, Texas prairie	E	2	D
Dogweed, ashy	E	2	D
Dropwort, Canby's	E	4	D
Evening-primrose, Antioch Dunes	E	1	S
Evening-primrose, Eureka Valley	E	1	S
Fleabane, rhizome	T	2	S
Four-o'clock, MacFarlane's	E	1	I
Frankenia, Johnston's	E	2	I
Gerardia, sandplain	E	5	S
Goetzea, beautiful (matabuey)	E	4	D
Goldenrod, Blue Ridge	T	4	U
Goldenrod, Short's	E	[illegible]	S
Gouania hillebrandii (=Sci. Name)	E	1	S
Grass, Eureka Dune	E	1	S
Grass, Solano	E	1	S
Groundsel, San Francisco Peaks	T	2	U
Gumplant, Ash Meadows	T	1	S
Heather, mountain golden	T	4	D
Hypericum, highlands scrub	E	4	D
Indian paintbrush, San Clemente Is.	E	1	I
Ivesia, Ash Meadows	T	1	S
Ladies'-tresses, Navasota	E	2	D
Larkspur, San Clemente Island	E	1	I
Lead-plant, Crenulate	E	4	S
Leather flower, Alabama	E	4	S
Lily, Minnesota trout	E	3	I
Liveforever, Santa Barbara Island	E	1	S
Lousewort, Furbish	E	5	S
Lupine, scrub	E	4	D
Mallow, Peter's Mountain	E	5	I
Manzanita, Presido (=Raven's)	E	1	I
Mesa-mint, San Diego	E	1	D
Milk-vetch, Ash Meadows	T	1	S
Milk-vetch, Jesup's	E	5	S
Milk-vetch, Mancos	E	2	D
Milkpea, Small's	E	4	D
Mint, Garrett's (=scrub, in part)	E	4	D
Mint, Lakela's	E	4	D
Mint, longspurred	E	4	D
Mint, scrub	E	4	D
Monkshood, northern wild	T	3	I
Mustard, Carter's	E	4	D
Niterwort, Amargosa	E	1	S
Pawpaw, beautiful	E	4	D
Pawpaw, four-petal	E	4	D
Pawpaw, Rugel's	E	4	D

Species	Listed As	Lead Region	Status
Pennyroyal, McKittrick	T	2	S
Pennyroyal, Todsen's	E	2	I
Phacelia, clay	E	6	D
Phacelia, North Park	E	6	U
Pitaya, Davis' green	E	2	D
Pitcher-plant, green	E	4	I
Plum, scrub	E	4	D
Pogonia, small whorled	E	5	I
Polygala, tiny	E	4	S
Poppy-mallow, Texas	E	2	D
Prickly-apple, fragrant	E	4	D
Prickly-ash, St. Thomas	E	4	D
Primrose, Maguire	T	6	D
Rattleweed, hairy	E	4	D
Rhododendron, Chapman's	E	4	D
Rush-pea, slender	E	2	D
Sedge, Navajo	T	2	U
Snakeroot	E	4	D
Snowbells, Texas	E	2	D
Spurge, deltoid	E	4	D
Spurge, Garber's	T	4	S
Sunray, Ash Meadows	T	1	S
Torreya, Florida	E	4	D
Tree, pygmy fringe	E	4	D
Trillium, persistent	E	4	S
Vetch, Hawaiian	E	1	S
Wallflower, Contra Costa	E	1	S
Whitlow-wort, papery	T	4	D
Wild-buckwheat, clay-loving	E	6	S
Wild-buckwheat, gypsum	T	2	S
Wild-rice, Texas	E	2	D
Wireweed	E	4	D
Ziziphus, Florida	E	4	D

Appendix II.

Status of the Development and Implementation of Recovery Plans for Listed Species

The status of an approved recovery plan for each listed species is indicated with either **Y** (Yes) or **N** (No). If a recovery plan is not anticipated as necessary, **NA** (Not Applicable) is reported.

The stage of development of a recovery plan for each listed species is indicated with **F** (Final-Approved), **Rev** (Revised), **A** (Agency Draft), **T** (Technical Draft), **TA** (Technical/Agency Draft), **U** (Under Development), **R** (Under Revision), **P** (Pending), or **NA** (Not Applicable).

The percentage of the species recovery objective that has been met is indicated with an integer from 1 to 4.

1= 0%-25% achieved

2= 26%-50% achieved

3= 51%-75% achieved

4= 76%-100% achieved

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
MAMMALS					
Bat, gray	E	3	Y	F	3
Bat, Hawaiian hoary	E	1	N	P	1
Bat, Indiana	E	3	Y	Rev	2
Bat, little Mariana fruit	E	1	N	A	1
Bat, Mariana fruit	E	1	N	A	1
Bat, Mexican long-nosed	E	2	N	U	1
Bat, Ozark big-eared	E	2	Y	F	1
Bat, Sanborn's long-nosed	E	2	N	P	1
Bat, Virginia big-eared	E	5	Y	F	2
Bear, grizzly or brown	T	6	Y	R	2
Caribou, woodland	E	1	Y	F	2
Cougar, eastern	E	5	Y	F	1
Deer, Columbian white-tailed	E	1	Y	Rev	4
Deer, key	E	4	Y	Rev	1
Dugong	E	1	N	P	1
Ferret, black-footed	E	6	Y	Rev	1
Fox, San Joaquin kit	E	1	Y	R	1
Jaguarundi (2 subspecies)	E	2	Y	F	1
Manatee, West Indian (Florida)	E	4	Y	Rev	1
Mouse, Alabama beach	E	4	Y	F	2
Mouse, Anastasia Island beach	E	4	N	U	1
Mouse, Choctawahatchee beach	E	4	Y	F	1
Mouse, Key Largo cotton	E	4	N	U	4
Mouse, Perdido Key beach	E	4	Y	F	2
Mouse, Salt marsh harvest	E	1	Y	F	1
Mouse, southeastern beach	T	4	N	U	1
Ocelot	E	2	Y	F	1
Otter, southern sea	T	1	Y	R	1
Panther, Florida	E	4	Y	Rev	1
Prairie dog, Utah	T	6	N	A	3
Pronghorn, Sonoran	E	2	Y	F	1
Rabbit, Lower Keys	E	4	N	P	1
Rat, Fresno kangaroo	E	1	N	A	1
Rat, giant kangaroo	E	1	N	U	2
Rat, Morro Bay kangaroo	E	1	Y	F	1
Rat, Stephens' kangaroo	T	1	N	U	1
Rat, Tipton kangaroo	E	1	N	U	1
Shrew, Dismal Swamp southeastern	T	5	N	NA	3
Squirrel, Carolina northern flying	E	4	Y	F	2
Squirrel, Delmarva Peninsula fox	E	5	Y	R	2
Squirrel, Mount Graham red	E	2	N	P	1
Squirrel, Virginia northern flying	E	5	Y	F	2
Vole, Amargosa	E	1	N	TA	1
Vole, Hualapai Mexican	E	2	N	TA	1
Wolf, gray (Eastern timber)	E,T	3	Y	R	3
Wolf, gray (Mexican)	E	2	Y	F	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Wolf, gray (Rocky Mountain)	E	6	Y	Rev	1
Wolf, red	E	4	Y	R	3
Woodrat, Key Largo	E	4	N	U	1
BIRDS					
Akepa, Hawaii (honeycreeper)	E	1	Y	F	2
Akepa, Maui (honeycreeper)	E	1	Y	F	1
Akialoa, Kauai (honeycreeper)	E	1	Y	F	1
Akiapola'au (honeycreeper)	E	1	Y	F	2
Blackbird, yellow-shouldered	E	4	Y	F	1
Bobwhite, masked (quail)	E	2	Y	Rev	2
Broadbill, Guam	E	1	Y	F	1
Caracara, Audubon's (Florida) crested	T	4	Y	F	1
Condor, California	E	1	Y	R	1
Coot, Hawaiian (='alae-ke'oke'o)	E	1	Y	Rev	3
Crane, Mississippi sandhill	E	4	Y	Rev	1
Crane, whooping	E	2	Y	Rev	2
Creeper, Hawaiian	E	1	Y	F	2
Creeper, Molokai (=kakawahie)	E	1	Y	F	1
Creeper, Oahu (=alauwahio)	E	1	N	P	1
Crow, Hawaiian (='alala)	E	1	Y	F	1
Crow, Mariana	E	1	Y	F	1
Curlew, Eskimo	E	7	N	P	1
Duck, Hawaiian (=koloa)	E	1	Y	Rev	3
Duck, Laysan	E	1	Y	F	3
Eagle, bald	E,T	3	Y	F	4
Falcon, American peregrine (Alaska)	E	7	Y	R	4
Falcon, American peregrine (eastern)	E	5	Y	Rev	3
Falcon, American peregrine (western)	E	1	Y	F	2
Falcon, Arctic peregrine	T	7	Y	R	4
Falcon, northern aplomado	E	2	Y	F	1
Finch, Laysan (honeycreeper)	E	1	Y	F	3
Finch, Nihoa (honeycreeper)	E	1	Y	F	3
Goose, Aleutian Canada	E	7	Y	R	3
Goose, Hawaiian (=nene)	E	1	Y	F	2
Hawk, Hawaiian (=io)	E	1	Y	F	4
Honeycreeper, crested (='akohekohe)	E	1	Y	F	2
Jay, Florida scrub	T	4	Y	F	1
Kingfisher, Guam Micronesian	E	1	Y	F	1
Kite, Everglade snail	E	4	Y	Rev	1
Mallard, Mariana	E	1	NA	NA	1
Megapode, Micronesian (La Perouse's)	E	1	N	P	1
Millerbird, Nihoa (old world warbler)	E	1	Y	F	3
Monarch, Tinian	T	1	NA	NA	4
Moorhen (gallinule), Hawaiian common	E	1	Y	Rev	3
Moorhen (gallinule), Mariana common	E	1	N	A	1
Nightjar (whip-poor-will), Puerto Rico	E	4	Y	F	2

Species	Listed As	Region	Recovery Plan App.	Stage	Achieve
Nukupu‘u (honeycreeper)	E	1	Y	F	1
‘O‘o, Kauai (=‘O‘o ‘A‘a)	E	1	Y	F	1
‘O‘u (honeycreeper)	E	1	Y	F	1
Owl, northern spotted	T	1	N	P	1
Palila (honeycreeper)	E	1	Y	Rev	3
Parrot, Puerto Rican	E	4	Y	Rev	1
Parrotbill, Maui (honeycreeper)	E	1	Y	F	1
Pelican, brown (California population)	E	1	Y	F	3
Pelican, brown (Eastern population)	E	2	Y	F	3
Petrel, Hawaiian dark-rumped	E	1	Y	F	2
Pigeon, Puerto Rican plain	E	4	Y	F	1
Plover, piping (Atlantic coastal)	T	5	Y	F	1
Plover, piping (interior)	E	3	Y	F	1
Po‘ouli (honeycreeper)	E	1	Y	F	1
Prairie-chicken, Attwater's greater	E	2	Y	F	1
Rail, California clapper	E	1	Y	F	1
Rail, Guam	E	1	Y	F	1
Rail, light-footed clapper	E	1	Y	Rev	1
Rail, Yuma clapper	E	2	Y	F	3
Shearwater, Newell's Townsend's	T	1	Y	F	2
Shrike, San Clemente loggerhead	E	1	Y	F	1
Sparrow, Cape Sable seaside	E	4	Y	F	2
Sparrow, dusky seaside	E	4	Y	F	1
Sparrow, Florida grasshopper	E	4	Y	F	1
Sparrow, San Clemente sage	T	1	Y	F	1
Stilt, Hawaiian (=ae‘o)	E	1	Y	Rev	3
Stork, wood	E	4	Y	F	2
Swiftlet, Mariana gray (=vanikoro)	E	1	N	A	1
Tern, California least	E	1	Y	Rev	1
Tern, least (interior population)	E	3	Y	F	1
Tern, roseate	E	5	Y	F	1
Thrush, large Kauai	E	1	Y	F	1
Thrush, Molokai (=oloma‘o)	E	1	Y	F	1
Thrush, small Kauai(=puaiohi)	E	1	Y	F	1
Towhee, Inyo brown	T	1	N	P	1
Vireo, black-capped	E	2	N	U	1
Vireo, least Bell's	E	1	N	A	1
Warbler (willow), nightingale reed	E	1	N	P	1
Warbler (wood), Bachman's	E	4	NA	NA	1
Warbler (wood), golden-cheeked	E	2	N	P	1
Warbler (wood), Kirtland's	E	3	Y	Rev	2
White-eye, bridled	E	1	Y	F	1
Woodpecker, ivory-billed	E	4	NA	NA	1
Woodpecker, red-cockaded	E	4	Y	Rev	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
REPTILES					
Anole, Culebra Island giant	E	4	Y	F	1
Boa, Mona	T	4	Y	F	1
Boa, Puerto Rican	E	4	Y	F	1
Boa, Virgin Islands tree	E	4	Y	F	1
Crocodile, American	E	4	Y	Rev	2
Crocodile, saltwater	E	1	N	U	1
Gecko, Monito	E	4	Y	F	1
Iguana, Mona ground	T	4	Y	F	2
Lizard, blunt-nosed leopard	E	1	Y	R	1
Lizard, Coachella Valley fringe-toed	T	1	Y	R	2
Lizard, Island night	T	1	Y	F	3
Lizard, St. Croix ground	E	4	Y	F	1
Rattlesnake, New Mexican ridge-nosed	T	2	Y	F	1
Skink, blue-tailed mole	T	4	N	P	1
Skink, sand	T	4	N	P	1
Snake, Atlantic salt marsh	T	4	N	U	1
Snake, Concho water	T	2	N	P	1
Snake, eastern indigo	T	4	Y	F	1
Snake, San Francisco garter	E	1	Y	F	1
Tortoise, desert	T	1	N	U	1
Tortoise, gopher	T	4	N	A	1
Turtle, Alabama red-bellied	E	4	Y	F	1
Turtle, flattened musk	T	4	Y	F	1
Turtle, green sea	E,T	2	Y	R	1
Turtle, hawksbill sea (=carey)	E	2	Y	R	1
Turtle, Kemp's (Atlantic) ridley sea	E	2	Y	R	1
Turtle, leatherback sea	E	2	Y	R	1
Turtle, loggerhead sea	T	2	Y	R	1
Turtle, olive (Pacific) ridley sea	E,T	2	Y	F	1
Turtle, Plymouth red-bellied	E	5	Y	Rev	2
Turtle, ringed sawback	T	4	Y	F	2
AMPHIBIANS					
Coqui, golden	T	4	Y	F	1
Salamander, Cheat Mountain	T	5	N	U	2
Salamander, desert slender	E	1	Y	F	1
Salamander, Red Hills	T	4	Y	F	1
Salamander, San Marcos	T	2	Y	R	1
Salamander, Santa Cruz long-toed	E	1	Y	Rev	1
Salamander, Shenandoah	E	5	NA	NA	1
Salamander, Texas blind	E	2	NA	NA	1
Toad, Houston	E	2	Y	F	1
Toad, Puerto Rican crested	T	4	N	A	1
Toad, Wyoming	E	6	N	T	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieve
FISHES					
Catfish, Yaqui	T	2	N	U	1
Cavefish, Alabama	E	4	Y	Rev	1
Cavefish, Ozark	T	4	Y	Rev	2
Chub, bonytail	E	6	Y	Rev	1
Chub, Borax Lake	E	1	Y	F	2
Chub, Chihuahua	T	2	Y	F	1
Chub, humpback	E	6	Y	Rev	1
Chub, Hutton tui	T	1	N	P	2
Chub, Mohave tui	E	1	Y	F	1
Chub, Owens tui	E	1	N	TA	1
Chub, Pahranagat roundtail	E	1	Y	F	1
Chub, slender	T	4	Y	F	1
Chub, Sonora	T	2	N	A	1
Chub, spotfin	T	4	Y	F	1
Chub, Virgin River	E	6	N	U	1
Chub, Yaqui	E	2	N	U	1
Cui-ui	E	1	Y	R	2
Dace, Ash Meadows speckled	E	1	Y	F	2
Dace, blackside	T	4	Y	F	1
Dace, Clover Valley speckled	E	1	N	P	1
Dace, desert	T	1	N	P	1
Dace, Foskett speckled	T	1	N	P	2
Dace, Independence Valley speckled	E	1	N	P	1
Dace, Kendall Warm Springs	E	6	Y	F	3
Dace, Moapa	E	1	Y	F	2
Darter, amber	E	4	Y	F	1
Darter, bayou	T	4	Y	R	1
Darter, boulder (=Elk River)	E	4	Y	F	1
Darter, fountain	E	2	Y	R	1
Darter, leopard	T	2	Y	R	2
Darter, Maryland	E	5	Y	Rev	1
Darter, Niangua	T	3	Y	F	1
Darter, Okaloosa	E	4	Y	F	1
Darter, slackwater	T	4	Y	F	1
Darter, snail	T	4	Y	F	1
Darter, watercress	E	4	Y	F	1
Gambusia, Big Bend	E	2	Y	F	2
Gambusia, Clear Creek	E	2	Y	F	2
Gambusia, Pecos	E	2	Y	F	2
Gambusia, San Marcos	E	2	Y	R	1
Killifish, Pahrump	E	1	Y	F	4
Logperch, Conasauga	E	4	Y	F	1
Logperch, Roanoke	E	5	N	U	1
Madtom, Neosho	T	6	N	P	1
Madtom, Scioto	E	3	NA	NA	1
Madtom, Smoky	E	4	Y	F	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Madtom, yellowfin	T	4	Y	F	1
Minnow, loach	T	2	N	TA	1
Pupfish, Ash Meadows Amargosa	E	1	Y	F	2
Pupfish, Comanche Springs	E	2	Y	F	1
Pupfish, desert	E	2	N	U	1
Pupfish, Devil's Hole	E	1	Y	Rev	2
Pupfish, Leon Springs	E	2	Y	F	2
Pupfish, Owens	E	1	Y	F	1
Pupfish, Warm Springs	E	1	Y	Rev	2
Sculpin, pygmy	T	4	N	U	1
Shiner, beautiful	T	2	N	U	1
Shiner, Cape Fear	E	4	Y	F	1
Shiner, Pecos bluntnose	T	2	N	TA	1
Silverside, Waccamaw	T	4	N	U	1
Spikedace	T	2	N	TA	1
Spinedace, Big Spring	T	1	N	TA	1
Spinedace, Little Colorado	T	2	N	U	1
Spinedace, White River	E	1	N	U	1
Springfish, Hiko White River	E	1	N	P	1
Springfish, Railroad Valley	T	1	N	U	1
Springfish, White River	E	1	N	P	1
Squawfish, Colorado	E	6	Y	R	1
Stickleback, unarmored threespine	E	1	Y	Rev	1
Sturgeon, pallid	E	6	N	P	1
Sucker, June	E	6	N	U	1
Sucker, Lost River	E	1	N	U	1
Sucker, Modoc	E	1	N	NA	1
Sucker, shortnose	E	1	N	U	1
Sucker, Warner	T	1	N	TA	1
Topminnow, Gila	E	2	Y	R	2
Topminnow, Yaqui	E	2	N	U	2
Trout, Apache	T	2	Y	F	2
Trout, Gila	E	2	Y	F	2
Trout, greenback cutthroat	T	6	Y	R	3
Trout, Lahontan cutthroat	T	1	N	A	1
Trout, Little Kern golden	T	1	NA	NA	2
Trout, Paiute cutthroat	T	1	Y	F	1
Woundfin	E	6	Y	R	1
SNAILS					
Shagreen, Magazine Mountain	T	4	N	U	1
Snail, Chittenango ovate amber	T	5	Y	F	1
Snail, flat-spired three-toothed land	T	5	Y	F	2
Snail, Iowa Pleistocene	E	3	Y	F	2
Snail, Noonday	T	4	Y	F	1
Snails, Oahu tree (19 species)	E	1	N	U	1
Snail, painted snake coiled forest	T	4	Y	F	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieve
Snail, Stock Island	T	4	Y	F	1
Snail, Virginia fringed mountain	E	5	Y	F	1
CLAMS					
Fanshell	E	4	N	P	1
Fatmucket, Arkansas	T	4	N	U	1
Heelsplitter, inflated	T	4	N	P	1
Mussel, Curtus'	E	4	Y	F	1
Mussel, dwarf wedge	E	5	N	P	1
Mussel, Judge Tait's	E	4	Y	F	1
Mussel, Marshall's	E	4	Y	F	1
Mussel, penitent	E	4	Y	F	1
Mussel, ring pink	E	4	N	T	1
Pearlshell, Louisiana	E	4	N	A	1
Pearly mussel, Alabama lamp	E	4	Y	F	1
Pearly mussel, Appalachain monkeyface	E	4	Y	F	1
Pearly mussel, birdwing	E	4	Y	F	1
Pearly mussel, cracking	E	4	N	T	1
Pearly mussel, Cumberland bean	E	4	Y	F	1
Pearly mussel, Cumberland monkeyface	E	4	Y	F	1
Pearly mussel, Curtis'	E	3	Y	F	1
Pearly mussel, dromedary	E	4	Y	F	1
Pearly mussel, green-blossom	E	4	Y	F	1
Pearly mussel, Higgins' eye	E	3	Y	F	1
Pearly mussel, little-wing	E	4	Y	F	1
Pearly mussel, orange-footed	E	4	Y	F	1
Pearly mussel, pale lilliput	E	4	Y	F	1
Pearly mussel, pink mucket	E	4	Y	F	1
Pearly mussel, purple cat's paw	E	4	N	P	1
Pearly mussel, tubercled-blossom	E	4	Y	F	1
Pearly mussel, turgid-blossum	E	4	Y	F	1
Pearly mussel, white cat's paw	E	3	Y	F	1
Pearly mussel, white wartyback	E	4	Y	F	1
Pearly mussel, yellow-blossom	E	4	Y	F	1
Pigtoe, fine-rayed	E	4	Y	F	1
Pigtoe, rough	E	4	Y	F	1
Pigtoe, shiny	E	4	Y	F	1
Pocketbook, fat	E	4	Y	R	2
Pocketbook, speckled	E	4	N	U	1
Riffle shell, tan	E	4	Y	F	1
Shell, stirrup	E	4	Y	F	1
Spinymussel, James River (=Virginia)	E	5	Y	F	1
Spinymussel, Tar River	E	4	Y	F	1
CRUSTACEANS					
Amphipod, Hay's spring	E	5	NA	NA	3
Crayfish, Cave	E	4	Y	F	1
Crayfish, Nashville	E	4	Y	Rev	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Crayfish, Shasta (=placid)	E	1	N	P	1
Isopod, Madison Cave	T	5	NA	NA	3
Isopod, Socorro	E	2	Y	F	4
Shrimp, Alabama cave	E	4	N	T	1
Shrimp, California freshwater	E	1	N	U	1
Shrimp, Kentucky Cave	E	4	Y	F	1
Shrimp, Squirrel Chimney (=Florida) cave	T	4	N	NA	1
INSECTS					
Beetle, Amer. burying (=giant carrion)	E	5	N	U	1
Beetle, delta green ground	T	1	Y	F	1
Beetle, Kretschmarr Cave mold	E	2	N	P	1
Beetle, northeastern beach tiger	T	5	N	P	1
Beetle, Puritan tiger	T	5	N	P	1
Beetle, Tooth Cave ground	E	2	N	P	1
Beetle, valley elderberry longhorn	T	1	Y	F	1
Butterfly, bay checkerspot	T	1	N	U	1
Butterfly, El Segundo blue	E	1	Y	F	1
Butterfly, Lange's metalmark	E	1	Y	F	1
Butterfly, lotis blue	E	1	Y	F	1
Butterfly, mission blue	E	1	Y	F	2
Butterfly, Oregon silverspot	T	1	Y	R	2
Butterfly, Palos Verde blue	E	1	Y	F	1
Butterfly, San Bruno elfin	E	1	Y	F	2
Butterfly, Schaus swallowtail	E	4	Y	F	1
Butterfly, Smith's blue	E	1	Y	F	1
Moth, Kern primrose sphinx	T	1	Y	F	1
Naucorid, Ash Meadows	T	1	Y	F	2
Skipper, Pawnee montane	T	6	N	P	1
ARACHNIDS					
Harvestman, Bee Creek Cave	E	2	N	P	1
Pseudoscorpion, Tooth Cave	E	2	N	P	1
Spider, Tooth Cave	E	2	N	P	1
PLANTS					
Achyranthes splendens var. *rotundata*	E	1	N	P	1
Agave, Arizona	E	2	N	U	1
'Akoko, Ewa Plains	E	1	N	P	1
Amphianthus, little	T	4	N	U	1
Arrowhead, bunched	E	4	Y	F	1
Aster, decurrent false	T	3	Y	F	1
Aster, Florida golden	E	4	Y	F	1
Aster, Ruth's golden	E	4	N	T	1
Avens, spreading	E	4	N	U	1
Barberry, Truckee	E	1	Y	F	1
Bariaco	E	4	N	A	1
Bear-poppy, dwarf	E	6	Y	F	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Beardtongue, Penland	E	6	N	TA	2
Beauty, Harper's	E	4	Y	F	1
Bellflower, Brooksville	E	4	N	U	1
Bidens, cuneate	E	1	NA	NA	1
Birch, Virginia round-leaf	E	5	Y	Rev	3
Bird's-beak, palmate-bracted	E	1	N	P	1
Bird's-beak, salt marsh	E	1	Y	F	1
Bittercress, small-anthered	E	4	N	U	1
Bladderpod, Dudley Bluffs	T	6	N	P	1
Bladderpod, lyrate	T	4	N	P	1
Bladderpod, Missouri	E	3	Y	F	2
Bladderpod, white	E	2	N	U	1
Blazingstar, Ash Meadows	T	1	Y	F	2
Blazingstar, Heller's	T	4	Y	F	1
Blazingstar, scrub	E	4	Y	F	2
Blue-star, Kearney's	E	2	N	U	1
Bluet, Roan Mountain	E	4	N	U	1
Bonamia, Florida	T	4	Y	F	3
Boxwood, Vahl's	E	4	Y	F	1
Broom, San Clemente Island	E	1	Y	F	1
Buckwheat, steamboat	E	1	N	P	1
Bush-clover, prairie	T	3	Y	F	1
Bush-mallow, San Clemente Island	E	1	Y	F	1
Buttercup, autumn	E	6	N	U	1
Button, Mohr's Barbara	T	4	N	U	1
Cactus, Arizona hedgehog	E	2	N	U	1
Cactus, Bakersfield	E	1	N	P	1
Cactus, black lace	E	2	Y	F	1
Cactus, Brady pincushion	E	2	Y	F	1
Cactus, bunched cory	T	2	Y	F	1
Cactus, Chisos Mountain hedgehog	T	2	N	P	1
Cactus, Cochise pincushion	T	2	N	P	1
Cactus, Key tree	E	4	Y	F	1
Cactus, Knowlton	E	2	Y	F	2
Cactus, Kuenzler hedgehog	E	2	Y	F	1
Cactus, Lee pincushion	T	2	Y	F	2
Cactus, Lloyd's hedgehog	E	2	NA	NA	1
Cactus, Lloyd's Mariposa	T	2	Y	F	1
Cactus, Mesa Verde	T	2	Y	F	1
Cactus, Nellie cory	E	2	Y	F	1
Cactus, Nichol's Turk's head	E	2	Y	F	1
Cactus, Peebles Navajo	E	2	Y	F	1
Cactus, San Rafael	E	6	N	P	1
Cactus, Siler pincushion	E	2	Y	F	2
Cactus, Sneed pincushion	E	2	Y	F	2
Cactus, spineless hedgehog	E	6	Y	F	1
Cactus, Tobusch fishhook	E	2	Y	F	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Cactus, Uinta Basin hookless	T	6	Y	F	3
Cactus, Wright fishhook	E	6	Y	F	3
Cassia mirabilis (=Sci. name)	E	4	N	U	1
Centaury, spring-loving	T	1	Y	F	2
Checker-mallow, pedate	E	1	N	U	1
Chumbo, higo	T	4	N	P	1
Cinquefoil, Robbins'	E	5	Y	F	2
Cliff-rose, Arizona	E	2	N	U	1
Clover, running buffalo	E	3	Y	F	1
Coneflower, Tennessee purple	E	4	Y	Rev	2
Coyote-thistle, Loch Lomond	E	1	NA	NA	4
Cress, toad-flax	E	6	N	P	1
Cycladenia, Jones	T	6	N	P	1
Cypress, Santa Cruz	E	1	N	P	1
Daisy, lakeside	T	3	Y	F	1
Daisy, Maguire	E	6	N	NA	4
Daphnopsis hellerana (=Sci. Name)	E	4	N	A	1
Dawn-flower, Texas prairie	E	2	Y	F	1
Dogweed, ashy	E	2	Y	F	1
Dropwort, Canby's	E	4	Y	F	1
Erubia	E	4	N	U	1
Spurge, Garber's	T	4	Y	F	1
Evening-primrose, Antioch Dunes	E	1	Y	F	2
Evening-primrose, Eureka Valley	E	1	Y	F	2
Evening-primrose, San Benito	T	1	N	A	1
Fern, Aleutian shield	E	7	N	P	1
Fern, American hart's-tongue	T	4	N	T	1
Fern, elfin tree	E	4	N	A	1
Fiddleneck, large-flowered	E	1	N	A	1
Fleabane, rhizome	T	2	Y	F	2
Four-o'clock, MacFarlane's	E	1	Y	F	2
Frankenia, Johnston's	E	2	Y	F	1
Gardenia, Hawaiian (=na'u)	E	1	N	P	1
Geocarpon minimum (=Sci. Name)	T	4	N	U	1
Gerardia, sandplain	E	5	Y	F	1
Globe-berry, Tumamoc	E	2	N	P	1
Goetzea, beautiful (matabuey)	E	4	Y	F	1
Goldenrod, Blue Ridge	T	4	Y	F	1
Goldenrod, Houghton's	T	3	N	T	1
Goldenrod, Short's	E	4	Y	F	2
Goldenrod, white-haired	T	4	N	U	1
Gooseberry, Miccosukee (Florida)	T	4	N	NA	1
Gouania hillebrandii (=Sci. Name)	E	1	Y	F	1
Grass, Eureka Dune	E	1	Y	F	2
Grass, Solano	E	1	Y	F	3
Groundsel, San Francisco Peaks	T	2	Y	F	2
Gumplant, Ash Meadows	T	1	Y	F	2

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Haplostachya, narrow-leaved	E	1	N	P	1
Harperella	E	5	N	U	1
Heartleaf, dwarf-flowered	T	4	N	U	1
Heather, mountain golden	T	4	Y	F	2
Higuero de Sierra	E	4	N	A	1
Holly, Cook's	E	4	N	A	1
Hypericum, highlands scrub	E	4	Y	F	2
Indian paintbrush, San Clemente Is.	E	1	Y	F	1
Iris, dwarf lake	T	3	N	U	1
Ivesia, Ash Meadows	T	1	Y	F	2
Jewelflower, California	E	1	N	P	1
Kauai hau kuahiwi	E	1	N	P	1
Ko'oloa'ula	E	1	N	P	1
Koki'o (=hau-hele'ula)	E	1	N	P	1
Koki'o, Cooke's	E	1	N	P	1
Ladies'-tresses, Navasota	E	2	Y	F	1
Lagu, Hyan (Serianthes)	E	1	N	P	1
Larkspur, San Clemente Island	E	1	Y	F	1
Lead-plant, Crenulate	E	4	Y	F	1
Leather flower, Alabama	E	4	Y	F	1
Lily, Minnesota trout	E	3	Y	F	1
Lipochaeta venosa (=Sci. Name)	E	1	N	P	1
Liveforever, Santa Barbara Island	E	1	Y	F	1
Locoweed, Fassett's	T	3	N	A	1
Lomatium, Bradshaw's	E	1	N	U	1
Loosestrife, rough-leaved	E	4	N	U	1
Lousewort, Furbish	E	5	Y	F	3
Lupine, scrub	E	4	Y	F	2
Mallow, Kern	E	1	N	P	1
Mallow, Peter's Mountain	E	5	Y	F	2
Manaca, palma de	T	4	N	P	2
Manzanita, Presido (=Raven's)	E	1	Y	F	2
Meadowrue, Cooley's	E	4	N	U	1
Mesa-mint, San Diego	E	1	Y	F	1
Milk-vetch, Ash Meadows	T	1	Y	F	2
Milk-vetch, heliotrope	T	6	N	P	1
Milk-vetch, Jesup's	E	5	Y	F	1
Milk-vetch, Mancos	E	2	Y	F	1
Milk-vetch, Osterhout	E	6	N	TA	2
Milkpea, Small's	E	4	Y	F	1
Milkweed, Mead's	T	3	N	U	1
Milkweed, Welsh's	T	6	N	U	1
Mint, Garrett's (=scrub, in part)	E	4	Y	F	1
Mint, Lakela's	E	4	Y	F	1
Mint, longspurred	E	4	Y	F	1
Mint, scrub	E	4	Y	F	1
Monkey-flower, Michigan	E	3	N	U	1

Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Monkshood, northern wild	T	3	Y	R	2
Mustard, Carter's	E	4	Y	F	1
Mustard, slender-petaled	E	1	N	U	1
Naupaka, dwarf	E	1	N	P	1
Negra, cobana	T	4	N	P	1
Nigua, palo de	E	4	N	A	1
Niterwort, Amargosa	E	1	Y	F	2
Oak, Hinckley's	T	2	N	P	1
Orchid, eastern prairie fringed	T	3	N	U	1
Orchid, western prairie fringed	T	3	N	U	1
Panicgrass, Carter's	E	1	N	P	1
Pawpaw, beautiful	E	4	Y	F	1
Pawpaw, four-petal	E	4	Y	F	1
Pawpaw, Rugel's	E	4	Y	F	1
Pelos del diablo	E	4	N	P	1
Pennyroyal, McKittrick	T	2	Y	F	2
Pennyroyal, Todsen's	E	2	Y	F	1
Penstemon, blowout	E	6	N	U	1
Peperomia, Wheeler's	E	4	N	A	1
Phacelia, clay	E	6	Y	F	1
Phacelia, North Park	E	6	Y	F	2
Pink, swamp	T	5	N	T	1
Pitaya, Davis' green	E	2	Y	F	1
Pitcher-plant, Alabama canebrake	E	4	N	U	1
Pitcher-plant, green	E	4	Y	Rev	2
Pitcher-plant, mountain sweet	E	4	N	A	1
Plum, scrub	E	4	Y	F	2
Pogonia, small whorled	E	5	Y	F	3
Polygala, tiny	E	4	Y	F	1
Pondberry	E	4	N	U	1
Poppy, Sacramento prickly	E	2	N	U	1
Poppy-mallow, Texas	E	2	Y	F	1
Potato-bean, Price's	T	4	N	U	1
Prickly-apple, fragrant	E	4	Y	F	1
Prickly-ash, St. Thomas	E	4	Y	F	1
Primrose, Maguire	T	6	Y	F	2
Quillwort, black-spored	E	4	N	U	1
Quillwort, mat-forming	E	4	N	U	1
Ramon, palo de	E	4	N	A	1
Rattleweed, hairy	E	4	Y	F	1
Rhododendron, Chapman's	E	4	Y	F	1
Ridge-cress (=pepper-cress), Barneby	E	6	N	P	1
Rock-cress, McDonald's	E	1	N	A	3
Rock-cress, shale barren	E	5	N	U	1
Rosa, palo de	E	4	N	U	1
Rush-pea, slender	E	2	Y	F	1
Sand-verbena, large-fruited	E	2	N	P	1

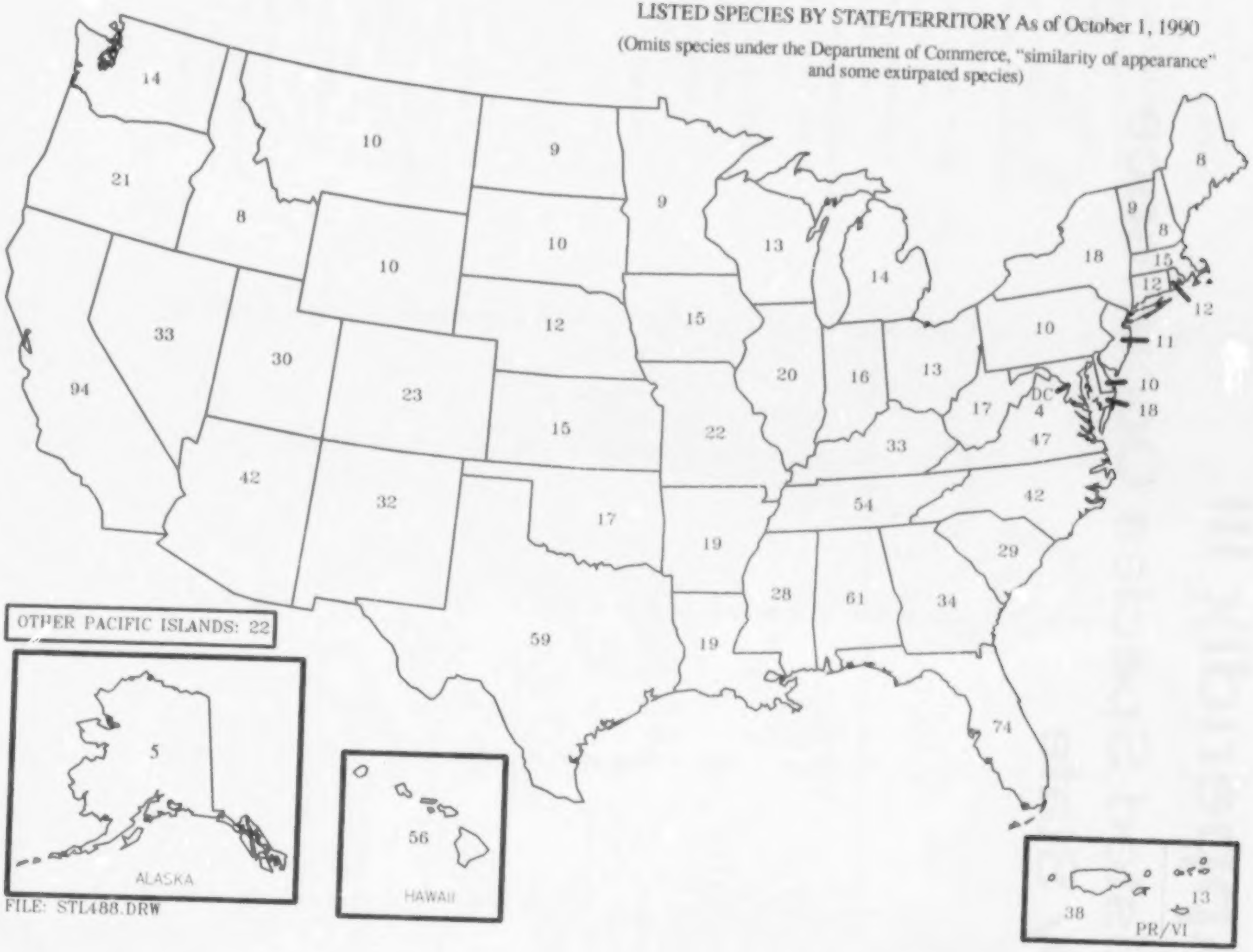
Species	Listed As	Region	Recovery Plan App.	Stage	Achieved
Sandalwood, Lanai or 'iliahi	E	1	N	P	1
Sandwort, Cumberland	E	4	N	U	1
Schiedea, Diamond Head	E	1	N	P	1
Sedge, Navajo	T	2	Y	F	1
Silversword, Mauna Kea (='Ahinahina)	E	1	N	U	1
Skullcap, large-flowered	E	4	N	U	1
Snakeroot	E	4	Y	F	1
Snowbells, Texas	E	2	Y	F	1
Spiraea, Virginia	T	5	N	P	1
Spineflower. slender-horned	E	1	N	U	1
Spurge, deltoid	E	4	Y	F	1
Stenogyne, narrow-leaved	E	1	N	P	1
Sumac, Michaux's	E	4	N	U	1
Sunray, Ash Meadows	T	1	Y	F	2
Thistle, Pitcher's	T	3	N	U	1
Thistle, Sacramento Mountains	T	2	N	U	1
Thornmint, San Mateo	E	1	N	P	1
Torreya, Florida	E	4	Y	F	1
Townsendia, Last Chance	T	6	N	A	1
Tree, pygmy fringe	E	4	Y	F	2
Trillium, persistent	E	4	Y	F	2
Trillium, relict	E	4	N	T	1
Twinpod, Dudley Bluffs	T	6	N	P	1
Uhiuhi	E	1	N	P	1
Vetch, Hawaiian	E	1	Y	F	1
Wallflower, Contra Costa	E	1	Y	F	2
Warea, wide-leaf	E	4	N	U	1
Water-plantain, Kral's	T	4	N	U	1
Water-willow, Cooley's	E	4	N	U	1
Whitlow-wort, papery	T	4	Y	F	3
Wild-buckwheat, clay-loving	E	6	Y	F	1
Wild-buckwheat, gypsum	T	2	Y	F	2
Wild-rice, Texas	E	2	Y	R	1
Wire-lettuce, Malheur	E	1	N	A	1
Wireweed	E	4	Y	F	3
Woolly-star, Hoover's	T	1	N	P	1
Woolly-star, Santa Ana River	E	1	N	U	1
Wooly-threads, San Joaquin	E	1	N	P	1
Ziziphus, Florida	E	4	Y	F	1

Appendix III.

Listed Species Occurrence by State

LISTED SPECIES BY STATE/TERRITORY As of October 1, 1990

(Omits species under the Department of Commerce, "similarity of appearance" and some extirpated species)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OTHER PACIFIC ISLANDS: 22
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ALASKA
56
HAWAII
38
13
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Species Account Number	Species	Listed As
	Alabama	
1	Bat, gray	E
3	Bat, Indiana	E
21	Mouse, Alabama beach	E
25	Mouse, Perdido Key beach	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
119	Stork, wood	E
136	Woodpecker, red-cockaded	E
154	Snake, eastern indigo	T
157	Tortoise, gopher	T
158	Turtle, Alabama red-bellied	E
159	Turtle, flattened musk	T
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
171	Salamander, Red Hills	T
180	Cavefish, Alabama	E
204	Darter, amber	E
206	Darter, boulder (=Elk River)	E
212	Darter, slackwater	T
213	Darter, snail	T
214	Darter, watercress	E
234	Sculpin, pygmy	T
271	Fanshell	E
273	Heelsplitter, inflated	T
274	Mussel, Curtus'	E
276	Mussel, Judge Tait's	E
277	Mussel, Marshall's	E
278	Mussel, penitent	E
279	Mussel, ring pink	E
281	Pearly mussel, Alabama lamp	E
284	Pearly mussel, cracking	E
286	Pearly mussel, Cumberland monkeyface	E
291	Pearly mussel, little-wing	E
292	Pearly mussel, orange-footed	E
293	Pearly mussel, pale lilliput	E
294	Pearly mussel, pink mucket	E
295	Pearly mussel, purple cat's paw	E
297	Pearly mussel, turgid-blossum	E
299	Pearly mussel, white wartyback	E
300	Pearly mussel, yellow-blossom	E

Species Account Number	Species	Listed As
301	Pigtoe, fine-rayed	E
303	Pigtoe, shiny	E
307	Shell, stirrup	E
316	Shrimp, Alabama cave	E
346	Amphianthus, little	T
364	Bladderpod, lyrate	T
379	Button, Mohr's Barbara	E
428	Fern, American hart's-tongue	T
450	Harperella	E
468	Leather flower, Alabama	E
520	Pitcher-plant, Alabama canebrake	E
521	Pitcher-plant, green	E
526	Pondberry	E
529	Potato-bean, Price's	T
564	Trillium, relict	E
570	Water-plantain, Kral's	T

Alaska

68	Curlew, Eskimo	E
72	Falcon, American peregrine (western)	E
75	Falcon, Arctic peregrine	T
79	Goose, Aleutian Canada	E
427	Fern, Aleutian shield	E

Arizona

8	Bat, Sanborn's long-nosed	E
19	Jaguarundi	E
28	Ocelot	E
32	Pronghorn, Sonoran	E
42	Squirrel, Mount Graham red	E
45	Vole, Hualapai Mexican	E
56	Bobwhite, masked (quail)	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
111	Rail, Yuma clapper	E
156	Tortoise, desert	T
179	Catfish, Yaqui	T
182	Chub, bonytail	E
185	Chub, humpback	E
191	Chub, Sonora	T
193	Chub, Virgin River	E
194	Chub, Yaqui	E
226	Minnow, loach	T
229	Pupfish, desert	E
235	Shiner, beautiful	T
239	Spikedace	T

pecies ccount umber	Species	Listed As
241	Spinedace, Little Colorado	T
246	Squawfish, Colorado	E
254	Topminnow, Yaqui	E
255	Trout, Apache	T
256	Trout, Gila	E
261	Woundfin	E
344	Agave, Arizona	E
370	Blue-star, Kearney's	E
380	Cactus, Arizona hedgehog	E
383	Cactus, Brady pincushion	E
386	Cactus, Cochise pincushion	T
395	Cactus, Nichol's Turk's head	E
396	Cactus, Peebles Navajo	E
398	Cactus, Siler pincushion	E
409	Cliff-rose, Arizona	E
414	Cycladenia, Jones	T
437	Globe-berry, Tumamoc	E
447	Groundsel, San Francisco Peaks	T
490	Milkweed, Welsh's	T
546	Sedge, Navajo	T
	Arkansas	
1	Bat, gray	E
3	Bat, Indiana	E
7	Bat, Ozark big-eared	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
122	Tern, least (interior population)	E
136	Woodpecker, red-cockaded	E
181	Cavefish, Ozark	T
208	Darter, leopard	T
248	Sturgeon, pallid	E
262	Shagreen, Magazine Mountain	T
272	Fatmucket, Arkansas	T
304	Pocketbook, fat	E
305	Pocketbook, speckled	E
311	Crayfish, Cave	E
320	Beetle, Amer. burying (=giant carrion)	E
435	*Geocarpon minimum* (=Sci. Name)	T
526	Pondberry	E
	California	
17	Fox, San Joaquin kit	E
26	Mouse, Salt marsh harvest	E
29	Otter, southern sea	T
34	Rat, Fresno kangaroo	E

Species Account Number	Species	Listed As
35	Rat, giant kangaroo	E
36	Rat, Morro Bay kangaroo	E
37	Rat, Stephens' kangaroo	E
38	Rat, Tipton kangaroo	E
44	Vole, Amargosa	E
59	Condor, California	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
79	Goose, Aleutian Canada	E
96	Owl, northern spotted	T
100	Pelican, brown (California plan)	E
108	Rail, California clapper	E
110	Rail, light-footed clapper	E
111	Rail, Yuma clapper	E
113	Shrike, San Clemente loggerhead	E
117	Sparrow, San Clemente sage	T
121	Tern, California least	E
127	Towhee, Inyo brown	T
129	Vireo, least Bell's	E
145	Lizard, blunt-nosed leopard	E
146	Lizard, Coachella Valley fringe-toed	T
147	Lizard, Island night	T
155	Snake, San Francisco garter	E
156	Tortoise, desert	T
160	Turtle, green sea	T
163	Turtle, leatherback sea	E
165	Turtle, olive (Pacific) ridley sea	T
170	Salamander, desert slender	E
173	Salamander, Santa Cruz long-toed	E
182	Chub, bonytail	E
187	Chub, Mohave tui	E
188	Chub, Owens tui	E
229	Pupfish, desert	E
232	Pupfish, Owens	E
246	Squawfish, Colorado	E
247	Stickleback, unarmored threespine	E
250	Sucker, Lost River	E
251	Sucker, Modoc	E
252	Sucker, shortnose	E
258	Trout, Lahontan cutthroat	T
259	Trout, Little Kern golden	T
260	Trout, Paiute cutthroat	T
313	Crayfish, Shasta (=placid)	E
317	Shrimp, California freshwater	E
321	Beetle, delta green ground	T

Species Account Number	Species	Listed As
326	Beetle, valley elderberry longhorn	T
327	Butterfly, bay checkerspot	T
328	Butterfly, El Segundo blue	E
329	Butterfly, Lange's metalmark	E
330	Butterfly, lotis blue	E
331	Butterfly, mission blue	E
332	Butterfly, Oregon silverspot	T
333	Butterfly, Palos Verde blue	E
334	Butterfly, San Bruno elfin	E
336	Butterfly, Smith's blue	E
337	Moth, Kern primrose sphinx	T
352	Barberry, Truckee	E
360	Bird's-beak, palmate-bracted	E
361	Bird's-beak, salt marsh	E
374	Broom, San Clemente Island	E
377	Bush-mallow, San Clemente Island	E
381	Cactus, Bakersfield	E
405	Centaury, spring-loving	T
406	Checker-mallow, pedate	E
412	Coyote-thistle, Loch Lomond	E
415	Cypress, Santa Cruz	E
424	Evening-primrose, Antioch Dunes	E
425	Evening-primrose, Eureka Valley	E
426	Evening-primrose, San Benito	T
430	Fiddleneck, Large-flowered	E
445	Grass, Eureka Dune	E
446	Grass, Solano	E
448	Gumplant, Ash Meadows	T
456	Indian paintbrush, San Clemente Is.	E
459	Jewelflower, California	E
466	Larkspur, San Clemente Island	E
471	Liveforever, Santa Barbara Island	E
477	Mallow, Kern	E
480	Manzanita, Presido (=Raven's)	E
482	Mesa-mint, San Diego	E
498	Mustard, slender-petaled	E
501	Niterwort, Amargosa	E
538	Rock-cress, McDonald's	E
552	Spineflower, slender-horned	E
559	Thornmint, San Mateo	E
568	Wallflower, Contra Costa	E
578	Woolly-star, Hoover's	T
579	Woolly-star, Santa Ana River	E
580	Wooly-threads, San Joaquin	E

Species Account Number	Species	Listed As
	Colorado	
16	Ferret, black-footed	E
62	Crane, whooping	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E
122	Tern, least (interior population)	E
182	Chub, bonytail	E
185	Chub, humpback	E
246	Squawfish, Colorado	E
257	Trout, greenback cutthroat	T
339	Skipper, Pawnee montane	T
355	Beardtongue, Penland	E
363	Bladderpod, Dudley Bluffs	T
388	Cactus, Knowlton	E
393	Cactus, Mesa Verde	T
400	Cactus, spineless hedgehog	E
402	Cactus, Unita Basin hookless	T
486	Milk-vetch, Mancos	E
487	Milk-vetch, Osterhout	E
517	Phacelia, North Park	E
565	Twinpod, Dudley Bluffs	T
573	Wild-buckwheat, clay-loving	E
	Connecticut	
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
123	Tern, roseate	E
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
323	Beetle, northeastern beach tiger	T
324	Beetle, Puritan tiger	T
436	Gerardia, sandplain	E
524	Pogonia, small whorled	E
	Delaware	
41	Squirrel, Delmarva Peninsula fox	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E

Species Account Number	Species	Listed As
164	Turtle, loggerhead sea	T
421	Dropwort, Canby's	E
518	Pink, swamp	T
	Florida	
1	Bat, gray	E
3	Bat, Indiana	E
14	Deer, key	E
20	Manatee, West Indian (Florida)	E
22	Mouse, Anastasia Island beach	E
23	Mouse, Choctawahatchee beach	E
24	Mouse, Key Largo cotton	E
25	Mouse, Perdido Key beach	E
27	Mouse, southeastern beach	T
30	Panther, Florida	E
33	Rabbit, Lower Keys	E
50	Woodrat, Key Largo	E
58	Caracara, Audubon's (Florida) crested	T
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
83	Jay, Florida scrub	T
85	Kite, Everglade snail	E
104	Plover, piping (Atlantic)	T
105	Plover, piping (Interior plan)	E,T
114	Sparrow, Cape Sable seaside	E
116	Sparrow, Florida grasshopper	E
119	Stork, wood	E
123	Tern, roseate	T
136	Woodpecker, red-cockaded	E
141	Crocodile, American	E
150	Skink, blue-tailed mole	T
151	Skink, sand	T
152	Snake, Atlantic salt marsh	T
154	Snake, eastern indigo	T
160	Turtle, green sea	E
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
211	Darter, Okaloosa	E
269	Snail, Stock Island	T
319	Shrimp, Squirrel Chimney (=Florida) cave	T
335	Butterfly, Schaus swallowtail	E
349	Aster, Florida golden	E
356	Beauty, Harper's	E
357	Bellflower, Brooksville	E

Species Account Number	Species	Listed As
369	Blazingstar, scrub	E
372	Bonamia, Florida	T
387	Cactus, Key tree	E
423	Spurge, Garber's (Chamaesyce garberi)	T
443	Gooseberry, Miccosukee (Florida)	T
455	Hypericum, highlands scrub	E
467	Lead-plant, Crenulate	E
476	Lupine, scrub	E
481	Meadowrue, Cooley's	E
488	Milkpea, Small's	E
491	Mint, Garrett's (=scrub, in part)	E
492	Mint, Lakela's	E
493	Mint, longspurred	E
494	Mint, scrub	E
497	Mustard, Carter's	E
508	Pawpaw, beautiful	E
509	Pawpaw, four-petal	E
510	Pawpaw, Rugel's	E
523	Plum, scrub	E
525	Polygala, tiny	E
526	Pondberry	E
530	Prickly-apple, fragrant	E
536	Rhododendron, Chapman's	E
549	Snakeroot	E
553	Spurge, deltoid	E
560	Torreya, Florida	E
562	Tree, pygmy fringe	E
569	Warea, wide-leaf	E
571	Water-willow, Cooley's	E
572	Whitlow-wort, papery	T
577	Wireweed (Polgonella basiramia)	E
581	Ziziphus, florida	E
	Georgia	
1	Bat, gray	E
3	Bat, Indiana	E
20	Manatee, West Indian (Florida)	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
119	Stork, wood	E
136	Woodpecker, red-cockaded	E
154	Snake, eastern indigo	T
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E

Species Account Number	Species	Listed As
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
204	Darter, amber	E
213	Darter, snail	T
220	Logperch, Conasauga	E
346	Amphianthus, little	T
379	Button, Mohr's Barbara	E
421	Dropwort, Canby's	E
450	Harperella	E
518	Pink, swamp	T
521	Pitcher-plant, green	E
526	Pondberry	E
533	Quillwort, black-spored	E
534	Quillwort, mat-forming	E
535	Rattleweed, hairy	E
548	Skullcap, large-flowered	E
551	Spiraea, Virginia	T
555	Sumac, Michaux's	E
560	Torreya, Florida	E
563	Trillium, persistent	E
564	Trillium, relict	E
	Hawaii	
2	Bat, Hawaiian hoary	E
51	'Akepa, Hawaii (honeycreeper)	E
52	'Akepa, Maui (honeycreeper)	E
53	'Akialoa, Kauai (honeycreeper)	E
54	'Akiapola'au (honeycreeper)	E
60	Coot, Hawaiian (='alae-ke'oke'o)	E
63	Creeper, Hawaiian	E
64	Creeper, Molokai (Kakawahie)	E
65	Creeper, Oahu (alauwahio)	E
66	Crow, Hawaiian ('alala)	E
69	Duck, Hawaiian (koloa)	E
70	Duck, Laysan	E
77	Finch, Laysan (honeycreeper)	E
78	Finch, Nihoa (honeycreeper)	E
80	Goose, Hawaiian (nene)	E
81	Hawk, Hawaiian (io)	E
82	Honeycreeper, crested ('akohekohe)	E
88	Millerbird, Nihoa (old world warbler)	E
90	Moorhen (gallinule), Hawaiian common	E
93	Nukupu'u (honeycreeper)	E
94	'O'o, Kauai (= 'O'o 'A'a)	E
95	'O'u (honeycreeper)	E

Species Account Number	Species	Listed As
97	Palila (honeycreeper)	E
99	Parrotbill, Maui (honeycreeper)	E
102	Petrel, Hawaiian dark-rumped	E
106	Po'ouli (honeycreeper)	E
112	Shearwater, Newell's Townsend's	T
118	Stilt, Hawaiian (=Ae'o)	E
124	Thrush, large Kauai	E
125	Thrush, Molokai (oloma'o)	E
126	Thrush, small Kauai (puaiohi)	E
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
165	Turtle, olive (Pacific) ridley sea	T
267	Snails, Oahu tree (19 spp.)	E
343	*Achyranthes splendes* var. *rotundata*	E
345	'Akoko, Ewa Plains	E
358	Bidens, cuneate	E
434	Gardenia, Hawaiian (na'u)	E
444	Gouania, Hillebrand's	E
449	Haplostachya, narrow-leaved	E
460	Kauai hau kuahiwi	E
461	Ko'oloa'ula	E
462	Koki'o (=hau-hele'ula)	E
463	Koki'o, Cooke's	E
470	Nehe (*Lipochaeta venosa*)	E
499	Naupaka, dwarf	E
507	Panicgrass, Carter's	E
543	Sandalwood, Lanai or 'iliahi	E
545	Schiedea, Diamond Head	E
547	Silversword, Mauna Kea ('Ahinahina)	E
554	Stenogyne, narrow-leaved	E
566	Uhiuhi (Mezoneuron)	E
567	Vetch, Hawaiian	E
	Idaho	
10	Bear, grizzly or brown	T
11	Caribou, woodland	E
48	Wolf, gray (Rocky Mountain plan)	E
62	Crane, whooping	E
71	Eagle, bald	T
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
432	Four-o'clock, MacFarlane's	E

Species Account Number	Species	Listed As
	Illinois	
1	Bat, gray	E
3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E,T
122	Tern, least (interior population)	E
248	Sturgeon, pallid	E
265	Snail, Iowa Pleistocene	E
271	Fanshell	E
290	Pearly mussel, Higgins' eye	E
292	Pearly mussel, orange-footed	E
294	Pearly mussel, pink mucket	E
296	Pearly mussel, tubercled-blossom	E
299	Pearly mussel, white wartyback	E
304	Pocketbook, fat	E
348	Aster, decurrent false	T
376	Bush-clover, prairie	T
416	Daisy, lakeside	T
503	Orchid, eastern prairie fringed	T
524	Pogonia, small whorled	E
557	Thistle, Pitcher's	T
	Indiana	
1	Bat, gray	E
3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E,T
122	Tern, least (interior population)	E
271	Fanshell	E
294	Pearly mussel, pink mucket	E
296	Pearly mussel, tubercled-blossom	E
298	Pearly mussel, white cat's paw	E
299	Pearly mussel, white wartyback	E
304	Pocketbook, fat	E
410	Clover, running buffalo	E
489	Milkweed, Mead's	T
557	Thistle, Pitcher's	T
	Iowa	
3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T

Species Account Number	Species	Listed As
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
248	Sturgeon, pallid	E
265	Snail, Iowa Pleistocene	E
290	Pearly mussel, Higgins' eye	E
304	Pocketbook, fat	E
376	Bush-clover, prairie	T
489	Milkweed, Mead's	T
496	Monkshood, northern wild	T
503	Orchid, eastern prairie fringed	T
504	Orchid, western prairie fringed	T

Kansas

1	Bat, gray	E
3	Bat, Indiana	E
62	Crane, whooping	E
68	Curlew, Eskimo	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
128	Vireo, black-capped	E
222	Madtom, Neosho	T
248	Sturgeon, pallid	E
410	Clover, running buffalo	E
489	Milkweed, Mead's	T
504	Orchid, western prairie fringed	T

Kentucky

1	Bat, gray	E
3	Bat, Indiana	E
9	Bat, Virginia big-eared	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
136	Woodpecker, red-cockaded	E
197	Dace, blackside	T
248	Sturgeon, pallid	E
271	Fanshell	E
279	Mussel, ring pink	E
284	Pearly mussel, cracking	E
285	Pearly mussel, Cumberland bean	E
288	Pearly mussel, dromedary	E
291	Pearly mussel, little-wing	E

Species Account Number	Species	Listed As
292	Pearly mussel, orange-footed	E
294	Pearly mussel, pink mucket	E
295	Pearly mussel, purple cat's paw	E
296	Pearly mussel, tubercled-blossom	E
299	Pearly mussel, white wartyback	E
302	Pigtoe, rough	E
304	Pocketbook, fat	E
306	Riffle shell, tan	E
318	Shrimp, Kentucky Cave	E
320	Beetle, Amer. burying (=giant carrion)	E
410	Clover, running buffalo	E
441	Goldenrod, Short's	E
442	Goldenrod, white-haired	T
529	Potato-bean, Price's	T
544	Sandwort, Cumberland	E
551	Spiraea, Virginia	T
	Louisiana	
20	Manatee, West Indian (Florida)	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
101	Pelican, brown (Eastern plan)	E
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
136	Woodpecker, red-cockaded	E
157	Tortoise, gopher	T
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
167	Turtle, ringed sawback	T
248	Sturgeon, pallid	E
273	Heelsplitter, inflated	T
280	Pearlshell, Louisiana	E
526	Pondberry	E
	Maine	
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
123	Tern, roseate	E
475	Lousewort, Furbish	E
503	Orchid, eastern prairie fringed	T
524	Pogonia, small whorled	E

Species Account Number	Species	Listed As
	Maryland	
3	Bat, Indiana	E
41	Squirrel, Delmarva Peninsula fox	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (interior)	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
209	Darter, Maryland	E
275	Mussel, dwarf wedge	E
323	Beetle, northeastern beach tiger	T
324	Beetle, Puritan tiger	T
421	Dropwort, Canby's	E
436	Gerardia, sandplain	E
450	Harperella	E
518	Pink, swamp	T
524	Pogonia, small whorled	E
	Massachusetts	
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (interior)	E,T
123	Tern, roseate	E,T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
166	Turtle, Plymouth red-bellied	E
275	Mussel, dwarf wedge	E
320	Beetle, Amer. burying (=giant carrion)	E
323	Beetle, northeastern beach tiger	T
324	Beetle, Puritan tiger	T
436	Gerardia, sandplain	E
524	Pogonia, small whorled	E
	Michigan	
3	Bat, Indiana	E
46	Wolf, gray (Eastern timber)	E,T
71	Eagle, bald	T
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E,T
133	Warbler (wood), Kirtland's	E
428	Fern, American hart's-tongue	T
440	Goldenrod, Houghton's	T

Species Account Number	Species	Listed As
457	Iris, dwarf lake	T
495	Monkey-flower, Michigan	E
503	Orchid, eastern prairie fringed	T
524	Pogonia, small whorled	E
557	Thistle, Pitcher's	T

Minnesota

Species Account Number	Species	Listed As
46	Wolf, gray (Eastern timber)	T
71	Eagle, bald	T
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E,T
290	Pearly mussel, Higgins' eye	E
376	Bush-clover, prairie	T
469	Lily, Minnesota trout	E
504	Orchid, western prairie fringed	T

Mississippi

Species Account Number	Species	Listed As
3	Bat, Indiana	E
20	Manatee, West Indian (Florida)	E
61	Crane, Mississippi sandhill	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
101	Pelican, brown (Eastern plan)	E
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
136	Woodpecker, red-cockaded	E
154	Snake, eastern indigo	T
157	Tortoise, gopher	T
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
167	Turtle, ringed sawback	T
205	Darter, bayou	T
248	Sturgeon, pallid	E
273	Heelsplitter, inflated	T
274	Mussel, Curtus'	E
276	Mussel, Judge Tait's	E
277	Mussel, Marshall's	E
278	Mussel, penitent	E
307	Shell, stirrup	E
526	Pondberry	E
529	Potato-bean, Price's	T

Species Account Number	Species	Listed As
	Missouri	
1	Bat, gray	E
3	Bat, Indiana	E
7	Bat, Ozark big-eared	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
181	Cavefish, Ozark	T
210	Darter, Niangua	T
222	Madtom, Neosho	T
248	Sturgeon, pallid	E
287	Pearly mussel, Curtis'	E
290	Pearly mussel, Higgins' eye	E
294	Pearly mussel, pink mucket	E
304	Pocketbook, fat	E
348	Aster, decurrent false	T
365	Bladder-pod, Missouri	E
435	*Geocarpon minimum* (=Sci. Name)	T
489	Milkweed, Mead's	T
504	Orchid, western prairie fringed	T
526	Pondberry	E
	Montana	
10	Bear, grizzly or brown	T
16	Ferret, black-footed	E
48	Wolf, gray (Rocky Mtn. plan)	E
62	Crane, whooping	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
248	Sturgeon, pallid	E
	Nebraska	
62	Crane, whooping	E
68	Curlew, Eskimo	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
248	Sturgeon, pallid	E
290	Pearly mussel, Higgins' eye	E
320	Beetle, Amer. burying (=giant carrion)	E

Species Account Number	Species	Listed As
504	Orchid, western prairie fringed	T
514	Penstemon, blowout	E

Nevada

Species Account Number	Species	Listed As
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
156	Tortoise, desert	T
182	Chub, bonytail	E
189	Chub, Pahranagat roundtail	E
193	Chub, Virgin River	E
195	Cui-ui	E
196	Dace, Ash Meadows speckled	E
198	Dace, Clover Valley speckled	E
199	Dace, desert	T
201	Dace, Independence Valley speckled	E
203	Dace, Moapa	E
219	Killifish, Pahrump	E
227	Pupfish, Ash Meadows Amargosa	E
230	Pupfish, Devil's Hole	E
233	Pupfish, Warm Springs	E
240	Spinedace, Big Spring	T
242	Spinedace, White River	E
243	Springfish, Hiko White River	E
244	Springfish, Railroad Valley	T
245	Springfish, White River	E
258	Trout, Lahontan cutthroat	T
261	Woundfin	E
338	Naucorid, Ash Meadows	T
367	Blazingstar, Ash Meadows	T
375	Buckwheat, steamboat	E
405	Centaury, spring-loving	T
448	Gumplant, Ash Meadows	T
458	Ivesia, Ash Meadows	T
483	Milk-vetch, Ash Meadows	T
501	Niterwort, Amargosa	E
556	Sunray, Ash Meadows	T

New Hampshire

Species Account Number	Species	Listed As
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
275	Mussel, dwarf wedge	E
324	Beetle, Puritan tiger	T
408	Cinquefoil, Robbins'	E
485	Milk-vetch, Jesup's	E
524	Pogonia, small whorled	E

Species Account Number	Species	Listed As
	New Jersey	
3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
323	Beetle, northeastern beach tiger	T
518	Pink, swamp	T
524	Pogonia, small whorled	E
	New Mexico	
6	Bat, Mexican long-nosed	E
8	Bat, Sanborn's long-nosed	E
47	Wolf, gray (Mexican Wolf plan)	E
62	Crane, whooping	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
122	Tern, least (interior population)	E
149	Rattlesnake, New Mexican ridge-nosed	T
184	Chub, Chihuahua	T
217	Gambusia, Pecos	E
226	Minnow, loach	T
235	Shiner, beautiful	T
237	Shiner, Pecos bluntnose	T
239	Spikedace	T
254	Topminnow, Yaqui	E
256	Trout, Gila	E
261	Woundfin	E
315	Isopod, Socorro	E
388	Cactus, Knowlton	E
389	Cactus, Kuenzler hedgehog	E
390	Cactus, Lee pincushion	T
391	Cactus, Lloyd's hedgehog	E
393	Cactus, Mesa Verde	T
399	Cactus, Sneed pincushion	E
431	Fleabane, rhizome	T
486	Milk-vetch, Mancos	E
512	Pennyroyal, McKittrick	T
513	Pennyroyal, Todsen's	E
527	Poppy, Sacramento prickly	E
558	Thistle, Sacramento Mountains	T
574	Wild-buckwheat, gypsum	T

Species Account Number	Species	Listed As
	New York	
3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
105	Plover, piping (Interior plan)	E
123	Tern, roseate	E
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
263	Snail, Chittenango ovate amber	T
275	Mussel, dwarf wedge	E
323	Beetle, northeastern beach tiger	T
428	Fern, American hart's-tongue	T
436	Gerardia, sandplain	E
496	Monkshood, northern wild	T
518	Pink, swamp	T
524	Pogonia, small whorled	E
	North Carolina	
3	Bat, Indiana	E
9	Bat, Virginia big-eared	E
20	Manatee, West Indian (Florida)	E
39	Shrew, Dismal Swamp southeastern	T
40	Squirrel, Carolina northern flying	E
49	Wolf, red	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
136	Woodpecker, red-cockaded	E
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
192	Chub, spotfin	T
236	Shiner, Cape Fear	E
238	Silverside, Waccamaw	T
266	Snail, noonday	T
275	Mussel, dwarf wedge	E
291	Pearly mussel, little-wing	E
309	Spinymussel, Tar River	E
347	Arrowhead, bunched	E
351	Avens, spreading	E

Species Account Number	Species	Listed As
362	Bittercress, small-anthered	E
368	Blazingstar, Heller's	T
371	Bluet, Roan Mountain	E
421	Dropwort, Canby's	E
439	Goldenrod, Blue Ridge	T
450	Harperella	E
451	Heartleaf, dwarf-flowered	T
452	Heather, mountain golden	T
474	Loosestrife, rough-leaved	E
481	Meadowrue, Cooley's	E
518	Pink, swamp	T
521	Pitcher-plant, green	E
522	Pitcher-plant, mountain sweet	E
524	Pogonia, small whorled	E
526	Pondberry	E
551	Spiraea, Virginia	T
555	Sumac, Michaux's	E
	North Dakota	
16	Ferret, black-footed	E
62	Crane, whooping	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
248	Sturgeon, pallid	E
504	Orchid, western prairie fringed	T
	Ohio	
3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E,T
223	Madtom, Scioto	E
271	Fanshell	E
294	Pearly mussel, pink mucket	E
298	Pearly mussel, white cat's paw	E
410	Clover, running buffalo	E
416	Daisy, lakeside	T
496	Monkshood, northern wild	T
503	Orchid, eastern prairie fringed	T
	Oklahoma	
1	Bat, gray	E
3	Bat, Indiana	E

pecies ccount umber	Species	Listed As
7	Bat, Ozark big-eared	E
62	Crane, whooping	E
68	Curlew, Eskimo	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
128	Vireo, black-capped	E
136	Woodpecker, red-cockaded	E
181	Cavefish, Ozark	T
208	Darter, leopard	T
222	Madtom, Neosho	T
320	Beetle, Amer. burying (=giant carrion)	E
504	Orchid, western prairie fringed	T

Oregon

13	Deer, Columbian white-tailed	E
71	Eagle, bald	T
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
79	Goose, Aleutian Canada	E
96	Owl, northern spotted	T
100	Pelican, brown (California plan)	E
160	Turtle, green sea	T
163	Turtle, leatherback sea	E
165	Turtle, olive (Pacific) ridley sea	T
183	Chub, Borax Lake	E
186	Chub, Hutton tui	T
200	Dace, Foskett speckled	T
250	Sucker, Lost River	E
252	Sucker, shortnose	E
253	Sucker, Warner	T
258	Trout, Lahontan cutthroat	T
332	Butterfly, Oregon silverspot	T
432	Four-o'clock, MacFarlane's	E
473	Lomatium, Bradshaw's	E
576	Wire-lettuce, Malheur	E

Pennsylvania

3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E,T
271	Fanshell	E
279	Mussel, ring pink	E

Species Account Number	Species	Listed As
323	Beetle, northeastern beach tiger	T
524	Pogonia, small whorled	E
551	Spiraea, Virginia	T
	Rhode Island	
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
123	Tern, roseate	E
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
320	Beetle, Amer. burying (=giant carrion)	E
323	Beetle, northeastern beach tiger	T
436	Gerardia, sandplain	E
524	Pogonia, small whorled	E
	South Carolina	
3	Bat, Indiana	E
20	Manatee, West Indian (Florida)	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T
119	Stork, wood	E
136	Woodpecker, red-cockaded	E
154	Snake, eastern indigo	T
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
346	Amphianthus, little	T
347	Arrowhead, bunched	E
421	Dropwort, Canby's	E
443	Gooseberry, Miccosukee (Florida)	T
450	Harperella	E
451	Heartleaf, dwarf-flowered	T
474	Loosestrife, rough-leaved	E
518	Pink, swamp	T
522	Pitcher-plant, mountain sweet	E
524	Pogonia, small whorled	E
526	Pondberry	E
533	Quillwort, black-spored	E
555	Sumac, Michaux's	E

Species Account Number	Species	Listed As
563	Trillium, persistent	E
564	Trillium, relict	E
	South Dakota	
16	Ferret, black-footed	E
62	Crane, whooping	E
68	Curlew, Eskimo	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	T
122	Tern, least (interior population)	E
248	Sturgeon, pallid	E
504	Orchid, western prairie fringed	T
	Tennessee	
1	Bat, gray	E
3	Bat, Indiana	E
40	Squirrel, Carolina northern flying	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
122	Tern, least (interior population)	E
136	Woodpecker, red-cockaded	E
190	Chub, slender	T
192	Chub, spotfin	T
197	Dace, blackside	T
206	Darter, boulder (=Elk River)	E
212	Darter, slackwater	T
213	Darter, snail	T
220	Logperch, Conasauga	E
224	Madtom, Smoky	E
225	Madtom, yellowfin	T
248	Sturgeon, pallid	E
268	Snail, painted snake coiled forest	T
271	Fanshell	E
279	Mussel, ring pink	E
281	Pearly mussel, Alabama lamp	E
282	Pearly mussel, Appalachain monkeyface	E
283	Pearly mussel, birdwing	E
284	Pearly mussel, cracking	E
285	Pearly mussel, Cumberland bean	E
286	Pearly mussel, Cumberland monkeyface	E
288	Pearly mussel, dromedary	E
289	Pearly mussel, green-blossom	E
291	Pearly mussel, little-wing	E
292	Pearly mussel, orange-footed	E

Species Account Number	Species	Listed As
293	Pearly mussel, pale lilliput	E
294	Pearly mussel, pink mucket	E
295	Pearly mussel, purple cat's paw	E
296	Pearly mussel, tubercled-blossom	E
297	Pearly mussel, turgid-blossum	E
299	Pearly mussel, white wartyback	E
300	Pearly mussel, yellow-blossom	E
301	Pigtoe, fine-rayed	E
302	Pigtoe, rough	E
303	Pigtoe, shiny	E
306	Riffle shell, tan	E
312	Crayfish, Nashville	E
350	Aster, Ruth's golden	E
351	Avens, spreading	E
371	Bluet, Roan Mountain	E
411	Coneflower, Tennessee purple	E
428	Fern, American hart's-tongue	T
439	Goldenrod, Blue Ridge	T
521	Pitcher-plant, green	E
529	Potato-bean, Price's	T
544	Sandwort, Cumberland	E
548	Skullcap, large-flowered	E
551	Spiraea, Virginia	T

Texas

Species Account Number	Species	Listed As
6	Bat, Mexican long-nosed	E
18	Jaguarundi	E
20	Manatee, West Indian (Florida)	E
28	Ocelot	E
62	Crane, whooping	E
68	Curlew, Eskimo	E
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
76	Falcon, northern aplomado	E
101	Pelican, brown (Eastern plan)	E
105	Plover, piping (Interior plan)	T
107	Prairie-chicken, Attwater's greater	E
122	Tern, least (interior population)	E
128	Vireo, black-capped	E
132	Warbler (wood), golden-cheeked	E
136	Woodpecker, red-cockaded	E
153	Snake, Concho water	T
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E

Species Account Number	Species	Listed As
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
172	Salamander, San Marcos	T
175	Salamander, Texas blind	E
176	Toad, Houston	E
207	Darter, fountain	E
215	Gambusia, Big Bend	E
216	Gambusia, Clear Creek	E
217	Gambusia, Pecos	E
218	Gambusia, San Marcos	E
228	Pupfish, Comanche Springs	E
231	Pupfish, Leon Springs	E
322	Beetle, Kretschmarr Cave mold	E
325	Beetle, Tooth Cave ground	E
340	Harvestman, Bee Creek Cave	E
341	Pseudoscorpion, Tooth Cave	E
342	Spider, Tooth Cave	E
366	Bladder-pod, white	E
382	Cactus, black lace	E
384	Cactus, bunched cory	T
385	Cactus, Chisos Mountain hedgehog	T
391	Cactus, Lloyd's hedgehog	E
392	Cactus, Lloyd's Mariposa	T
394	Cactus, Nellie cory	E
399	Cactus, Sneed pincushion	E
401	Cactus, Tobusch fishhook	E
419	Dawn-flower, Texas prairie	E
420	Dogweed, ashy	E
433	Frankenia, Johnston's	E
464	Ladies'-tresses, Navasota	E
502	Oak, Hinckley's	T
512	Pennyroyal, McKittrick	T
519	Pitaya, Davis' green	E
528	Poppy-mallow, Texas	E
541	Rush-pea, slender	E
542	Sand-verbena, large-fruited	E
550	Snowbells, Texas	E
575	Wild-rice, Texas	E

Utah

Species Account Number	Species	Listed As
16	Ferret, black-footed	E
31	Prairie dog, Utah	T
62	Crane, whooping	E
71	Eagle, bald	E,T
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T

Species Account Number	Species	Listed As
156	Tortoise, desert	T
182	Chub, bonytail	E
185	Chub, humpback	E
193	Chub, Virgin River	E
246	Squawfish, Colorado	E
249	Sucker, June	E
258	Trout, Lahontan cutthroat	T
261	Woundfin	E
354	Bear-poppy, dwarf	E
378	Buttercup, autumn	E
397	Cactus, San Rafael	E
398	Cactus, Siler pincushion	E
400	Cactus, spineless hedgehog	E
402	Cactus, Unita Basin hookless	T
403	Cactus, Wright fishhook	E
413	Cress, toad-flax	E
414	Cycladenia, Jones	T
417	Daisy, Maguire	E
484	Milk-vetch, heliotrope	T
490	Milkweed, Welsh's	T
516	Phacelia, clay	E
532	Primrose, Maguire	T
537	Ridge-cress (=pepper-cress), Barneby	E
561	Townsendia, Last Chance	T

Vermont

Species Account Number	Species	Listed As
3	Bat, Indiana	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
275	Mussel, dwarf wedge	E
324	Beetle, Puritan tiger	T
408	Cinquefoil, Robbins'	E
485	Milk-vetch, Jesup's	E
524	Pogonia, small whorled	E

Virginia

Species Account Number	Species	Listed As
1	Bat, gray	E
3	Bat, Indiana	E
9	Bat, Virginia big-eared	E
39	Shrew, Dismal Swamp southeastern	T
41	Squirrel, Delmarva Peninsula fox	E
43	Squirrel, Virginia northern flying	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
104	Plover, piping (Atlantic)	T

ecies ccount umber	Species	Listed As
136	Woodpecker, red-cockaded	E
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
174	Salamander, Shenandoah	E
190	Chub, slender	T
192	Chub, spotfin	T
221	Logperch, Roanoke	E
225	Madtom, yellowfin	T
270	Snail, Virginia fringed mountain	E
271	Fanshell	E
275	Mussel, dwarf wedge	E
282	Pearly mussel, Appalachain monkeyface	E
283	Pearly mussel, birdwing	E
284	Pearly mussel, cracking	E
285	Pearly mussel, Cumberland bean	E
286	Pearly mussel, Cumberland monkeyface	E
288	Pearly mussel, dromedary	E
289	Pearly mussel, green-blossom	E
291	Pearly mussel, little-wing	E
294	Pearly mussel, pink mucket	E
301	Pigtoe, fine-rayed	E
302	Pigtoe, rough	E
303	Pigtoe, shiny	E
306	Riffle shell, tan	E
308	Spinymussel, James River (=Virginia)	E
314	Isopod, Madison Cave	T
323	Beetle, northeastern beach tiger	T
359	Birch, Virginia round-leaf	E
478	Mallow, Peter's Mountain	E
503	Orchid, eastern prairie fringed	T
518	Pink, swamp	T
524	Pogonia, small whorled	E
539	Rock-cress, shale barren	E
551	Spiraea, Virginia	T
	Washington	
10	Bear, grizzly or brown	T
11	Caribou, woodland	E
13	Deer, Columbian white-tailed	E
48	Wolf, gray (Rocky Mtn. plan)	E
71	Eagle, bald	T
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T

Species Account Number	Species	Listed As
79	Goose, Aleutian Canada	E
96	Owl, northern spotted	T
100	Pelican, brown (California plan)	E
160	Turtle, green sea	T
163	Turtle, leatherback sea	E
165	Turtle, olive (Pacific) ridley sea	T
332	Butterfly, Oregon silverspot	T
	West Virginia	
3	Bat, Indiana	E
9	Bat, Virginia big-eared	E
43	Squirrel, Virginia northern flying	E
71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
169	Salamander, Cheat Mountain	T
264	Snail, flat-spired three-toothed land	T
271	Fanshell	E
279	Mussel, ring pink	E
294	Pearly mussel, pink mucket	E
296	Pearly mussel, tubercled-blossom	E
308	Spinymussel, James River (=Virginia)	E
410	Clover, running buffalo	E
450	Harperella	E
539	Rock-cress, shale barren	E
551	Spiraea, Virginia	T
	Wisconsin	
3	Bat, Indiana	E
46	Wolf, gray (Eastern timber)	E
71	Eagle, bald	T
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
105	Plover, piping (Interior plan)	E,T
133	Warbler (wood), Kirtland's	E
290	Pearly mussel, Higgins' eye	E
376	Bush-clover, prairie	T
457	Iris, dwarf lake	T
472	Locoweed, Fassett's	T
496	Monkshood, northern wild	T
557	Thistle, Pitcher's	T
	Wyoming	
10	Bear, grizzly or brown	T
16	Ferret, black-footed	E
48	Wolf, gray (Rocky Mtn. plan)	E
62	Crane, whooping	E

pecies ccount umber	Species	Listed As
71	Eagle, bald	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
178	Toad, Wyoming	E
202	Dace, Kendall Warm Springs	E
246	Squawfish, Colorado	E

COMMONWEALTHS, TERRITORIES, AND DISTRICT OF COLUMBIA

American Samoa

160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
165	Turtle, olive (Pacific) ridley sea	T

District of Columbia

71	Eagle, bald	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
310	Amphipod, Hay's spring	E

Guam

4	Bat, little Mariana fruit	E
5	Bat, Mariana fruit	E
57	Broadbill, Guam	E
67	Crow, Mariana	E
84	Kingfisher, Guam Micronesian	E
91	Moorhen (gallinule), Mariana common	E
109	Rail, Guam	E
120	Swiftlet, Mariana gray (=Vanikoro)	E
134	White-eye, bridled	E
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
165	Turtle, olive (Pacific) ridley sea	T
465	Lagu, Hyan (Serianthes)	E

Commonwealth of the Northern Mariana Islands

67	Crow, Mariana	E
86	Mallard, Mariana	E
87	Megapode, Micronesian (La Perouse's)	E
89	Monarch, Tinian	T
91	Moorhen (gallinule), Mariana common	E
120	Swiftlet, Mariana gray (=Vanikoro)	E
130	Warbler (willow), nightingale reed	E
160	Turtle, green sea	T

Species Account Number	Species	Listed As
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
165	Turtle, olive (Pacific) ridley sea	T
465	Lagu, Hyan (Serianthes)	E
	Palau (Trust)	
15	Dugong	E
87	Megapode, Micronesian (La Perouse's)	E
142	Crocodile, saltwater	E
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
165	Turtle, olive (Pacific) ridley sea	T
	Puerto Rico	
20	Manatee, West Indian (Florida)	E
55	Blackbird, yellow-shouldered	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
92	Nightjar (whip-poor-will), Puerto Rico	E
98	Parrot, Puerto Rican	E
101	Pelican, brown (Eastern plan)	E
103	Pigeon, Puerto Rican plain	E
123	Tern, roseate	T
137	Anole, Culebra Island giant	E
138	Boa, Mona	T
139	Boa, Puerto Rican	E
143	Gecko, Monito	E
144	Iguana, Mona ground	T
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
168	Coqui, golden	T
177	Toad, Puerto Rican crested	T
353	Bariaco	E
373	Boxwood, Vahl's	E
404	*Cassia mirabilis* (=Sci. name)	E
407	Chumbo, higo	T
418	*Daphnopsis hellerana* (=Sci. Name)	E
422	Erubia	E
429	Fern, elfin tree	E
438	Goetzea, beautiful (matabuey)	E
453	Higuero de Sierra	E
454	Holly, Cook's	E

Species Account Number	Species	Listed As
479	Manaca, palma de	T
500	Negra, cobana	T
505	Nigua, Palo de	E
506	Palo de Ramon	E
511	Pelos del diablo	E
515	Peperomia, Wheeler's	E
531	Prickly-ash, St. Thomas	E
540	Rosa, palo de	E
	Virgin Islands	
20	Manatee, West Indian (Florida)	E
73	Falcon, American peregrine (Eastern plan)	E
75	Falcon, Arctic peregrine	T
101	Pelican, brown (Eastern plan)	E
123	Tern, roseate	T
140	Boa, Virgin Islands tree	E
148	Lizard, St. Croix ground	E
160	Turtle, green sea	T
161	Turtle, hawksbill sea (=carey)	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
177	Toad, Puerto Rican crested	T
531	Prickly-ash, St. Thomas	E

Appendix IV.

Individual Species Recovery Progress Reports

Key to Species Accounts

1. **Species:** Common name, followed by scientific name
2. **Group:** Mammals, Birds, Reptiles, Amphibians, Fishes, Snails, Clams, Crustaceans, Insects, Arachnids, Plants
3. **Listing/Date:** Threatened or Endangered/Date final rule published if Threatened or Endangered
4. **Species Status:** Improving, Stable, Declining, Extinct, Unknown.
5. **Recovery Priority:** Ranking from 1 to 18 (see explanation, p. 8).
6. **Recovery Plan Title:**

   For listed species with more than one recovery plan, a separate report has been completed for each recovery plan (unless the lead Region for recovery can summarize the total species' status [i.e. bald eagle]. For species with no recovery plan and none intended, "N/A" indicates that a plan is not applicable. If no recovery plan has been initiated but one will be written at some point, "Pending" is inserted.
7. **Lead Region/Region Responsible for Recovery Plan:**

   If the lead Region for the species is different from the Region responsible for the plans, each Region is listed. Otherwise, there is only one number to indicate the lead for recovery of the species.
8. **Recovery Plan Stage/Date:**

   For Stage, the designations are: **F** (Final-Approved), **Rev** (Revision-Approved) **A** (Agency Draft), **T** (Technical Draft), **TA** (Technical/Agency Draft), **U** (Under Development), **R** (Under Revision), **P** (Pending, but not yet scheduled for initiation), or **NA** (Not Applicable). The date of the most recent work on the plan is indicated, if applicable.
9. **Recovery Objective/Criteria:**

   Recovery Objectives are selected among: Delist, Downlist, or Stabilize, if the objectives have been identified. The criteria are summarized in the narrative portion. Quantitative information is included, if known.
10. **Major Activity Since Last Report:**

    Although this is the first published report to Congress on the endangered species recovery program, numerous recovery activities have been described in earlier agency reports. This report represents activities occurring in the past few years, or since any previous reports.
11. **Major Activity Over Next Reporting Period:**

    High priority tasks to be continued or initiated, and intended result are outlined.
12. **Recovery Achieved:**

    The progress toward recovery is indicated on a fractional scale, with "1" signifying 0-25% of the total recovery objective being met, "2" signifying 26-50%, "3" signifying 51-75%, "4" signifying 76-100%.
13. **Information Current as of:**

    The Date of the information presented on each individual species report.

Appendix IV. Mammals

Mammals

Gray bat 1

1. Species: Gray bat *(Myotis grisescens)*
2. Listing/Date: Endangered/April 28, 1976
3. Group: Mammals
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Gray Bat Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/July 8, 1982
9. Recovery Objective/Criteria: Delisting. The species may be reclassified to threatened when, over a 5-year period, 75% of the priority 1 maternity caves show stable or increasing populations and 90% of the priority 1 hibernacula have permanent protection. Additionally, the species may be considered recovered when 25% of the priority 2 caves are permanently protected and show stable or increasing populations over a 5-year period.
10. Major Activity Since Last Report: A study is underway to look at the possible effects of contaminants at several gray bat caves in Missouri where past gray bat population declines are suspected to have resulted from contaminants.
11. Major Activity Over Next Reporting Period: Caves will continue to be protected from disturbance by landowner contacts, conservation agreements, and erecting gates, fencing and restrictive signs. Censusing of high priority maternity and winter cave populations will continue. Section 7 consultation will continue to protect caves used by the species.
12. Recovery Achieved: 3
13. Information Current as of: July 26, 1990

Hawaiian hoary bat 2

1. Species: Hawaiian hoary bat (*Lasiurus cinereus semotus*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Mammals
4. Species Status: Unknown
5. Recovery Priority: 15
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None is anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

3 Indiana bat

1. Species: Indiana bat (*Myotis sodalis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for the Indiana Bat
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: Rev/October 14, 1983
9. Recovery Objective/Criteria: Delisting. Reclassification to threatened will occur when permanent protection and stable populations for 3 consecutive censuses have been achieved at 7 of the 9 priority 1 caves. Delisting shall occur when the same conditions apply to 50% of the priority 2 hibernacula.
10. Major Activity Since Last Report: Guano found at priority 1 and 2 hibernacula in Regions 3 and 4 was analyzed for pesticides and other contaminants. Preliminary data indicate that the species is experiencing measurable exposure to organophosphates, possibly contributing to species decline. The first year of summer habitat studies in Missouri and Indiana was completed (section 6 funding). These studies are aimed at determining if differences in summer habitat or its use are causing different population trends across the species' range. The first year of a human disturbance study (Section 6 funding) was completed at three caves in Indiana. Preliminary data analysis indicates that disturbance is contributing to overwinter weight loss, but a second year's study is needed to confirm this preliminary finding.
11. Major Activity Over Next Reporting Period: Both summer habitat studies will be continued. The final report from a separate five-year (Section 6 funded) study in Illinois will be completed. The winter human disturbance study will be continued for its final year. Population censusing at top priority caves will continue. Acquisition of several priority 2 caves will be pursued via Section 6 funding. Section 7 consultation will continue to protect occupied summer and winter sites. Guidelines for summer habitat protection will be developed based upon results of summer habitat research to date. Caves will continue to be protected from disturbance by landowner contacts, conservation agreements, and erecting gates, fencing and restrictive signs.
12. Recovery Achieved: 2
13. Information Current as of: July 25, 1990

4 Little Marianas fruit bat

1. Species: Little Marianas fruit bat (*Pteropus tokudae*)
2. Listing/Date: Endangered/August 27, 1984
3. Group: Mammals
4. Species Status: Extinct
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for the Marianas Fruit Bat and Little Marianas Fruit Bat
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A/Final Draft—Not Approved as of yet
9. Recovery Objective/Criteria: N/A (believed to be extinct)
10. Major Activity Since Last Report: Drafted proposal for critical habitat designation.
11. Major Activity Over Next Reporting Period: Propose critical habitat designation on Guam.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Marianas fruit bat 5

Species: Marianas fruit bat (*Pteropus mariannus mariannus*)

Listing/Date: Endangered/August 27, 1984

Group: Mammals

Species Status: Declining

Recovery Priority: 3

Recovery Plan Title: Recovery Plan for the Marianas Fruit Bat and Little Marianas Fruit Bat

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: A/1986—Not Approved yet

Recovery Objective/Criteria: To reclassify status to threatened by increasing the population on Guam to 2,500 through natural recruitment, and to establish a minimum of two permanent bat colonies in northern Guam and a single permanent colony in southern Guam.

10. Major Activity Since Last Report: The Guam Division of Aquatic and Wildlife Resources continues to monitor the bat population on Guam. Drafted proposal for critical habitat designation.

11. Major Activity Over Next Reporting Period: Continue a monitoring program on Guam. Strengthen law enforcement capabilities to control poaching. Continue an intensive research and management effort to control the brown tree snake. Propose critical habitat designation on Guam.

12. Recovery Achieved: 1

13. Information Current as of: August 1990

Mexican long-nosed bat 6

. Species: Mexican long-nosed bat (*Leptonycteris nivalis*)

. Listing/Date: Endangered/September 30, 1988

. Group: Mammals

. Species Status: Unknown

. Recovery Priority: 5

. Recovery Plan Title: Pending

. Lead Region/Region Responsible for Recovery Plan: Region 2

. Recovery Plan Stage/Date: U

9. Recovery Objective/Criteria: To be developed.

10. Major Activity Since Last Report: Recovery plan under development; draft due from contractor December 15, 1990

11. Major Activity Over Next Reporting Period: Recovery Plan will be finalized

12. Recovery Achieved: 1

13. Information Current as of: July 1990

7 Ozark big-eared bat

1. Species: Ozark big-eared bat (*Plecotus townsendii ingens*)
2. Listing/Date: Endangered/November 30, 1979
3. Group: Mammals
4. Species Status: U
5. Recovery Priority: 3
6. Recovery Plan Title: A Recovery Plan for the Ozark Big-Eared Bat and Virginia Big-Eared Bat
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/May 8, 1984
9. Recovery Objective/Criteria: Stabilize/Prevent extinction of the Ozark big-eared bat
10. Major Activity Since Last Report: The search for new caves in eastern Oklahoma was extended into western Arkansas. Population monitoring at known maternity caves and hibernacula was continued. Oklahoma State University is finalizing report on habitat characteristics of maternity roosts and hibernacula. The Oklahoma Department of Wildlife Conservation (ODWC) was funded through Sec. 6 for a second year to measure microclimate, size, structure, and entrance aspect of caves and distribution and abundance of foraging areas surrounding caves. The Nature Conservancy is continuing negotiations with a land owner in an attempt to purchase an important maternity cave. The ODWC was funded through Sec. 6 to develop agreements with private land owners for protection and management of important caves on their property.
11. Major Activity Over Next Reporting Period: Continue search for new caves in Oklahoma and Arkansas. Continue population monitoring. Complete OSU study. Develop and begin to implement a protection and management plan for the Oklahoma Bat Cave National Wildlife Refuge. Continue Section 6 project of protection and management of caves on private land. Attempt to purchase important cave. Try to initiate telemetry study of habitat use.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

8 Sanborn's long-nosed bat

1. Species: Sanborn's long-nosed bat ((*Leptonycteris sanborni*) (=*yerbabuenae*))
2. Listing/Date: Endangered/September 30, 1988
3. Group: Mammals
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Historic habitat in Colossal Cave has been renovated. Some bat use may have been detected.
11. Major Activity Over Next Reporting Period: Draft Recovery Plan
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Virginia big-eared bat

9

1. Species: Virginia big-eared bat (*Plecotus townsendii virginianus*)
2. Listing/Date: Endangered/November 30, 1979
3. Group: Mammals
4. Species Status: Improving
5. Recovery Priority: 9
6. Recovery Plan Title: A Recovery Plan for the Ozark Big-Eared Bat and the Virginia Big-Eared Bat
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/May 8, 1984
9. Recovery Objective/Criteria: Downlist/Long-term protection of 95% of all known active colonies and stable or increasing populations at 95% of the known maternity colonies and hibernacula.
10. Major Activity Since Last Report: Protection of maternity colony sites and hibernacula in association with monitoring of maternity colonies. Also, a study of the impacts of various activities on foraging behavior has been conducted over the past 2 years. Sec. 7 activities constitute a significant portion of recovery efforts for this species. The population remains stable overall.
11. Major Activity Over Next Reporting Period: Continued monitoring and protection of maternity colonies. The foraging study will also continue.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Grizzly bear

10

In addition to requiring large expanses of land, grizzly bears have one of the lowest reproductive rates among terrestrial mammals. Reproductive intervals for females average three years and average litter sizes are two cubs. Grizzlies are listed as threatened in Montana, Idaho, Wyoming, and Washington.

1. Species: Grizzly bear (*Ursus arctos horribilis*)
2. Listing/Date: Threatened/July 28, 1975
3. Group: Mammals
4. Species Status: Stable
5. Recovery Priority: 3C
6. Recovery Plan Title: Grizzly Bear Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: R/F/January 29, 1982
9. Recovery Objective/Criteria: Delist: Yellowstone population—15 females with cubs and family groups reported in 15 of 18 Management Units and human-caused mortality does not exceed 7 total or 2 females; Northern Continental Divide population—22 females with cubs, family groups in 20 of 23 units, and human-caused mortality not to exceed 14 total or 6 females; Cabinet/Yaak population—4 females with cubs, family groups in 18 of 21 units, and human-caused mortality not to exceed a total of 3; Selkirk population—4 females with cubs, family groups in 4 of 7 units, and mortality not to exceed 3 total. These numbers are to be calculated annually, some based on a running 6 year average, others based on a running 3 year average. Criteria for Bitterroot and North Cascades populations are not developed.
10. Major Activity Since Last Report: An agreement with British Columbia Wildlife Branch and Ministry of Forests outlining cooperation in management and research has been completed. Habitat evaluation in the Bitterroot ecosystem was begun. A computer model of resource use effects in grizzly bear habitat has been completed. One bear was relocated from British Columbia into U.S. to augment Cabinet/Yaak population. A record number of cubs (57) were born in the Yellowstone Ecosystem in 1990.
11. Major Activity Over Next Reporting Period: Information is being gathered to evaluate status of the Northern Continental Divide (NCD) population and analyze if population objectives have been achieved. Development of a conservation plan to ensure existence of adequate regulatory management strategies will be done in FY 91 for the NCD population. The Grizzly Bear Recovery Plan revision will be finalized in FY 91. Placement of 3 more females in the Cabinet/Yaak Ecosystem is planned for FY 91. Programs to monitor the population status in the Yellowstone Ecosystem will continue. In the Selkirk Ecosystem, monitoring will also continue on the dispersal of subadults from Canada into the United States.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

11 Woodland Caribou

1. Species: Woodland Caribou [Selkirk Mountain population] (*Rangifer tarandus caribou*)
2. Listing/Date: Endangered/January 14, 1983
3. Group: Mammals
4. Species Status: Improving (but only due to the transplants)
5. Recovery Priority: 3C
6. Recovery Plan Title: Selkirk Mountain Caribou Management Plan/Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/April 12, 1983
9. Recovery Objective/Criteria: Manage for an interior population of approximately 100 animals. Currently at 60-70 animals due to infusion of 60 transplanted caribou, some of which have suffered natural mortality and one man-caused mortality.
10. Major Activity Since Last Report: The third transplant was done in March 1990, when 12 new animals were added to the Selkirk population. Native and transplanted populations are reproducing.
11. Major Activity Over Next Reporting Period: Continue to monitor transplanted and native caribou herds to determine mortality, reproduction, survivability, habitat use and dispersal work. This is being done with Section 6 Funds and can only be continued with these funds.
12. Recovery Achieved: 2
13. Information Current as of: July 17, 1990

12 Eastern cougar

1. Species: Eastern cougar (*Felis concolor couguar*)
2. Listing/Date: Endangered/June 4, 1973
3. Group: Mammals
4. Species Status: Extinct
5. Recovery Priority: 18
6. Recovery Plan Title: Eastern Cougar Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/August 2, 1982
9. Recovery Objective/Criteria: Thought to be extinct. Nevertheless, the criterion for downlisting is the discovery or establishment of one population with a minimum of 50 breeding adults. The criterion for delisting is the discovery or establishment of 3 self-sustaining populations, each containing a minimum of 50 breeding adults.
10. Major Activity Since Last Report: None.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Columbian white-tailed deer 13

1. Species: Columbian white-tailed deer (*Odocoileus virginianus leucurus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Mammals
4. Species Status: Improving
5. Recovery Priority: 15
6. Recovery Plan Title: Columbian White-tailed Deer Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/June 14, 1983
9. Recovery Objective/Criteria:

   Lower Columbia River population: Downlist: A minimum of 400 Columbian white-tailed deer (CWTD) can be maintained in at least 3 viable subpopulations, two of which must be located on secured habitat. Delist: A minimum of 400 CWTD can be maintained in at least 3 viable subpopulations distributed in suitable secure habitat.

   Roseburg population: Downlist: 1000 CWTD can be maintained viable on lands within the Umpqua Basin of Douglas County and the relative proportions of CWTD habitat within the known range of the species in Douglas County are not deteriorated from current conditions. Delist: A minimum viable population can be maintained at 500 deer distributed in 5,500 acres of suitable, secure habitat within the Umpqua Basin of Douglas County, Oregon on lands owned, controlled, protected, or otherwise dedicated to the conservation of CWTD.

The Columbian white-tailed deer prefers moist prairie and woodland habitat. In 1972, the Fish and Wildlife Service established the Columbian White-Tailed Deer National Wildlife Refuge in the State of Washington to protect the habitat of the species.

10. Major Activity Since Last Report: Land acquisition along Lower Columbia River initiated by Fish and Wildlife Service. Range expansion analysis and disease studies are ongoing for Roseburg population by state wildlife agency. Identification of suitable recovery lands for purchase or conservation easements and initial contacts with principal landowners were made in the Roseburg area by state and federal wildlife agencies. Continuation of population monitoring.
11. Major Activity Over Next Reporting Period: Preparation of a downlist package with special rules. Continuation of land acquisition efforts for the Lower Columbia River population. Continuation of efforts to secure habitat for the Roseburg population. Continuation of population monitoring.
12. Recovery Achieved: 4
13. Information Current as of: July 24, 1990

Key deer 14

1. Species: Key deer (*Odocoileus virginianus clavium*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Key Deer Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/June 19, 1985.
9. Recovery Objective/Criteria: Stabilize/Focus of the recovery actions is on the prevention of a further decline of the Key deer and the preservation of its integrity as a subspecies within its range. Population objective is to maintain a stable population of 250-300 deer.
10. Major Activity Since Last Report: Development of population viability analysis and species survival plan. Ongoing land acquisition to increase Key Deer Refuge. Habitat management studies. (Prescribed burning and exotic pest plant control). Roadside clearing in mortality area. Reduction of speed limit on U.S. 1. Posting of warning signs. Public service announcements for motorists. Provision of water on non-fresh water keys.
11. Major Activity Over Next Reporting Period: Continuation of studies and habitat management. Development of census methods.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

15 Dugong

1. Species: Dugong (*Dugong dugong*)
2. Listing/Date: Endangered/December 2, 1970
3. Group: Mammals
4. Species Status: Unknown
5. Recovery Priority: 4
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: An aerial survey of the dugongs of Belau (the only area within our jurisdiction where they are known to occur) is planned for early in 1991.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

16 Black-footed ferret

1. Species: Black-footed ferret (*Mustela nigripes*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Mammals
4. Species Status: Improving (captive propagation)
5. Recovery Priority: 2
6. Recovery Plan Title: Black-footed Ferret Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Rev/August 8, 1988; F/June 14, 1978
9. Recovery Objective/Criteria: Downlist after the following have been achieved—increase captive breeding population to 200 breeding adults, establish a prebreeding census population of 1500 free-ranging breeding adults in 10 or more populations, encourage widest possible distribution of reintroduced populations, extinction rate of subpopulations is at or below establishment rate of new subpopulations for 5 yrs. Recovery area required is 185,000 acres.
10. Major Activity Since Last Report: Captive breeding populations increased to 118 ferrets. Successful weaning of 67 ferrets in 1990 further augments the population. The draft management plan for black-footed ferrets at Meeteetse was completed and public hearings were held. Black-footed Ferret Interstate Coordinating Committee evaluated and prioritized seven nominated potential reintroduction sites. A proposed rule and environmental assessment for designating a reintroduced population at Meeteetse, WY as "experimental" has been drafted, with a back-up site at Shirley Basin, WY. A reward program to locate a wild population was continued.
11. Major Activity Over Next Reporting Period: Management plans and environmental documents for three high priority reintroduction sites will be developed by FY 92. Information will be collected for evaluation of additional reintroduction sites. Reintroduction of ferrets will begin by 1991. Additional captive breeding populations will be set up at several additional zoos to reduce potential seriousness of disease outbreaks. Captive breeding will continue in order to maximize numbers available for reintroduction.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

San Joaquin kit fox 17

Species: San Joaquin kit fox (*Vulpes macrotis mutica*)

Listing/Date: Endangered/March 11, 1967

Group: Mammals

Species Status: Declining

Recovery Priority: 3C

Recovery Plan Title: San Joaquin Kit Fox Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: R/F/January 31, 1983

Recovery Objective/Criteria: Downlist when at least 4 independent reserves with a minimum of 10,000 contiguous acres totaling at least 225,000 acres are secured and at least 5 areas on public land are designated as high priority for kit fox protection, with a minimum of 5,000 contiguous acres totaling at least 100,000 acres. All areas must show self-sustaining or increasing populations for a minimum of 10 consecutive years.

10. Major Activity Since Last Report: Large land acquisitions and exchanges by the Bureau of Land Management and The Nature Conservancy in the southern part of the range. Inventory of potentially good habitat in the northern portion if the range.
11. Major Activity Over Next Reporting Period: Continuation of #10. Completion of the recovery plans for the San Joaquin Valley listed species.
12. Recovery Achieved: 1
13. Information Current as of: July 20, 1990

Jaguarundi 18,19

1. Species: Jaguarundi (2 subspecies) (*Felis yagouaroundi cacomitli*) and (*Felis yagouaroundi tolteca*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Mammals
4. Species Status: Unknown
5. Recovery Priority: 6
6. Recovery Plan Title: Listed Cats of Arizona and Texas Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/August 22, 1990
9. Recovery Objective/Criteria: Downlist and Delist
10. Major Activity Since Last Report: Trapping and photo documentation efforts both on and off Laguna Atascosa National Wildlife Refuge (NWR), Texas, continued, primarily focused on ocelots but also in hopes of documenting jaguarundi. On several occasions trapping efforts focused in areas where jaguarundi sightings were reported. One intensive effort was in Unit VI near refuge headquarters. However, all efforts were unsuccessful. Revegetation of former farm fields in order to convert the fields to ocelot/jaguarundi habitat continued on the Laguna Atascosa NWR. From November-February, 18,000 seedlings consisting primarily of ebony, whitebrush and brasil, as well as tepehuaje, wild olive, and mesquite, have been planted on approximately 230 acres.
11. Major Activity Over Next Reporting Period: During the next reporting period the Service plans an intensive status evaluation to determine the presence/absence of resident populations of the jaguarundi. Concentration would be on actively surveying areas of confirmed presence and expand surveys in Class I and II sighting areas.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

20

West Indian manatee

The manatee is found in warm shallow coastal waters south of North Carolina. Female calves reach maturity in approximately 4 years, whereas males take 7 years.

1. Species: West Indian manatee (*Trichechus manatus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Florida Manatee Recovery Plan, West Indian Manatee Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/July 24, 1989.
9. Recovery Objective/Criteria:

   Florida manatee—Downlist/ Establish and maintain a viable, self-sustaining population of manatees on both the Atlantic and Gulf Coasts. Downlisting should be considered when population modeling indicates that the population is growing or is stable, when mortality factors are controlled at acceptable levels or are decreasing, and when habitats are secure and threats are controlled or are decreasing.

   West Indian Manatee—A proposal has been written to conduct a study of the West Indian manatee population at Roosevelt Roads Naval Station on southeastern Puerto Rico. The study will be funded by the U.S. Navy and will include estimating population numbers, determining habitat use, and movement patterns. Results of the study will be utilized to assess the status of the population in southeastern Puerto Rico. Additionally, an ongoing project is being conducted to obtain population estimates for Puerto Rico.
10. Major Activity Since Last Report: **West Indian manatee**—Population estimates for southeastern Puerto Rico will be initiated during the next year, as well as describing the composition of the areas primarily used by manatees for feeding. Information on movement patterns will also be collected. **Florida manatee**—The revised Florida Manatee Recovery Plan was approved by the Regional Director on May 2, 1989. The Merritt Island National Wildlife Refuge established a 15 square mile manatee sanctuary in the Banana River Lagoon, Brevard County, Florida. The 1990 Florida Legislature passed a manatee protection bill which expands the Department of Natural Resources authority to protect manatees under the Florida Manatee Sanctuary Act.
11. Major Activity Over Next Reporting Period: **Florida manatee**—Involved Agencies and groups are developing participation schedules to implement tasks outlined in the revised recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

WARNING
MANATEE AREA
PROCEED WITH
CAUTION

Powerboats are the greatest threat to manatees as they are often fatally struck by propellers. The Fish and Wildlife Service and the State of Florida are working together to establish protective zones. In March 1990, a new manatee sanctuary was established, in cooperation with the National Aeronautics and Space Administration, at Merritt Island National Wildlife Refuge.

Alabama beach mouse

21

1. Species: Alabama beach mouse (*Peromyscus polionotus ammobates*)
2. Listing/Date: Endangered/June 6, 1985
3. Group: Mammals
4. Species Status: Improving
5. Recovery Priority: 3C
6. Recovery Plan Title: Choctawhatchee Beach Mouse, Perdido Key Beach Mouse and Alabama Beach Mouse Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 12, 1987
9. Recovery Objective/Criteria: Downlisting. The subspecies may be considered for downlisting when there are 3 distinct, self-sustaining populations in each of the critical habitat areas and at least 50% of the critical habitat is both protected and inhabited by Alabama beach mice.
10. Major Activity Since Last Report: The major activities have been the captive propagation of Alabama beach mice and their subsequent release in areas designated as Alabama beach mouse critical habitat.
11. Major Activity Over Next Reporting Period: Major activities over the next reporting period will be monitoring the wild beach mouse populations and continued studies of beach mouse genetic viability.
12. Recovery Achieved: 2
13. Information Current as of: June 1990

Anastasia Island beach mouse

22

1. Species: Anastasia Island beach mouse (*Peromyscus polionotus phasma*)
2. Listing/Date: Endangered/May 12, 1989
3. Group: Mammals
4. Species Status: Improving
5. Recovery Priority: 6C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Ongoing Game and Fish Commission study on the mouse's population distribution and on the effects of feral cats.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

23 Choctawhatchee beach mouse

1. Species: Choctawhatchee beach mouse (*Peromyscus polionotus allophrys*)
2. Listing/Date: Endangered/June 6, 1985
3. Group: Mammals
4. Species Status: Unknown
5. Recovery Priority: 3C
6. Recovery Plan Title: Choctawhatchee Beach Mouse, Perdido Key Beach Mouse and Alabama Beach Mouse Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 12, 1987
9. Recovery Objective/Criteria: Downlist/Species can be considered for downlisting to threatened when there are 3 distinct, self-sustaining populations in each of the critical habitat areas, and a minimum of 50% of the critical habitat is protected and occupied by mice.
10. Major Activity Since Last Report: Two proposed large-scale residential developments in critical habitat.
11. Major Activity Over Next Reporting Period: Possible development of a Habitat Conservation Plan in response to the above mentioned developments.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

24 Key Largo cotton mouse

1. Species: Key Largo cotton mouse (*Peromyscus gossypinus allapaticola*)
2. Listing/Date: Endangered/September 21, 1983
3. Group: Mammals
4. Species Status: Stable
5. Recovery Priority: 3C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Land acquisition by state continues.
11. Major Activity Over Next Reporting Period: Continuing land acquisition.
12. Recovery Achieved: 4
13. Information Current as of: July 1990

Perdido Key beach mouse

. Species: Perdido Key beach mouse (*Peromyscus polionotus trissyllepsis*)

. Listing/Date: Endangered/June 6, 1985

. Group: Mammals

. Species Status: Improving

. Recovery Priority: 3C

. Recovery Plan Title: Choctawhatchee Beach Mouse, Perdido Key Beach Mouse, and Alabama Beach Mouse Recovery Plan

. Lead Region/Region Responsible for Recovery Plan: Region 4

. Recovery Plan Stage/Date: F/August 12, 1987

. Recovery Objective/Criteria: Downlist/The subspecies may be considered for downlisting when there are 3 distinct, self-sustaining populations in each of the critical habitat areas and at least 50% of the critical habitat is both protected and inhabited by Perdido Key beach mice.

10. Major Activity Since Last Report: The major activities have been the captive propagation of Perdido Key beach mice and their subsequent release on Perdido Key, monitoring the wild population, creation of new habitat by beach refurbishment, and genetics research. Five-year study funded by the Navy to determine effects of beach nourishment on Perdido Key beach mice.

11. Major Activity Over Next Reporting Period: Major activities over the next reporting period will include monitoring Perdido Key beach mouse populations, continued beach refurbishment, monitoring whether mice use the created habitat, and continuing research into the genetic viability of the subspecies.

12. Recovery Achieved: 2

13. Information Current as of: July 1990

The Perdido Key beach mouse is found in limited sand dune habitat along the border of Alabama and Florida, which is under increasing development pressure. The species reached critically low numbers in the early 1980s, but is now improving.

26 Salt marsh harvest mouse

1. Species: Salt marsh harvest mouse (*Reithrodontomys raviventris*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: California Clapper Rail/Salt Marsh Harvest Mouse Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/November 16, 1984
9. Recovery Objective/Criteria: Downlist or delist northern subspecies; downlist southern subspecies when 3,900 hectares of public-owned habitat are secured, 3200 hectares of privately owned habitat are secured, and an additional 7,000 hectares of largely unsuitable habitat are restored and secured.
10. Major Activity Since Last Report: Contaminants study by Region 8 FWS Research on other marsh mammals.
11. Major Activity Over Next Reporting Period: 1) Contaminants study by Region 8 FWS Research on other marsh mammals and 2) possible habitat acquisition via expansion of San Francisco Bay National Wildlife Refuge.
12. Recovery Achieved: 1
13. Information Current as of: July 17, 1990

27 Southeastern beach mouse

1. Species: Southeastern beach mouse (*Peromyscus polionotus niveiventris*)
2. Listing/Date: Threatened/May 12, 1989
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None.
11. Major Activity Over Next Reporting Period: None anticipated. Negative impacts to habitat as a result of missile launch programs.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Ocelot 28

The ocelot, found in the U.S. in southern Texas and Arizona, is threatened by continued illegal poaching and loss of habitat.

1. Species: Ocelot (*Felis (Leopardus) pardalis*)
2. Listing/Date: Endangered/March 30, 1972; July 21, 1982
3. Group: Mammals
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Listed Cats of Arizona and Texas Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/August 22, 1990
9. Recovery Objective/Criteria: Downlist and delist
10. Major Activity Since Last Report: An average of 10 radio-collared ocelots on Laguna Atascosa National Wildlife Refuge (NWR) Texas were monitored during FY 1990, especially those that were dispersing or suspected of denning behavior. Personnel of the Caesar Kleberg Wildlife Research Institute (Texas A&I) also continued trapping efforts in and around the refuge until April, when all traps used for the cat trapping program were retrieved and stored. At that time, project emphasis shifted toward entering and analyzing data. The corridor study continued through April of 1990 by Todd Bishop of Caesar Kleberg. Monitoring of both bobcats (8-20 radio collared) and ocelots provided an insight on the habitat needs of the residential cats. Information proved especially valuable in determining vegetation types and the size of corridors used by ocelots. This information has been incorporated into the revegetation project that is currently underway at the refuge. In April, Todd Bishop completed his data gathering and monitoring of the radio-collared cats and is currently producing his thesis on the movement within corridors. Revegetation of former farm fields in order to convert the fields to ocelot habitat continued on the Laguna Atascosa NWR. From November-February 18,000 seedlings consisting primarily of ebony, whitebrush and brasil, and also tepehuaje, wild olive, and mesquite, have been planted on approximately 230 acres. In June, a translocated female on the west side of the Cayo Atascosa demonstrated definite denning behavior. Three separate searches were undertaken with no kittens located. A "possible" den site was located during reconnaissance of the area. This incident is encouraging as it is the first translocated female to apparently produce young. The researcher's data indicates that the kittens were 4 weeks old and potentially able to move short distances from the den site. No translocation efforts were carried out during the year. No dispersing activity occurred that was deemed life-threatening (i.e. continued crossing of a busy highway). Texas Parks and Wildlife Department is continuing their effort to systematically quantify (rate reliability of sightings) state-wide observations of ocelot, jaguarundi and mountain lion.
11. Major Activity Over Next Reporting Period: Hopefully during the next reporting period, three studies will be funded that will be invaluable in efforts to recover the ocelot. One would be a carry-over of work presently being done in and around the Laguna Atascosa NWR to other areas of the Rio Grande Valley to determine the presence or absence of ocelot populations. The project would greatly assist efforts to identify and protect potential ocelot habitat in South Texas. Another project would be examining blood samples taken from ocelots to determine if a possible loss of genetic variability has occurred due to the highly isolated and fragmented ocelot populations in South Texas. A final project would be a study of food habits of the ocelot. This would be accomplished by developing a reference collection and proceed with analysis of scat already collected to determine food habits.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

29 Southern sea otter

1. Species: Southern sea otter (*Enhydra lutris nereis*)
2. Listing/Date: Threatened/January 14, 1977
3. Group: Mammals
4. Species Status: Stable
5. Recovery Priority: 9C
6. Recovery Plan Title: Southern Sea Otter Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: R/Rev/December 26, 1985
9. Recovery Objective/Criteria: The Recovery Plan is currently under revision. The old (original) objectives are being revised.
10. Major Activity Since Last Report: Translocations were initiated in 1987. The State of California legislated gill net closures to reduce incidental take of otters.
11. Major Activity Over Next Reporting Period: The Recovery Plan will be revised.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

30 Florida panther

1. Species: Florida panther (*Felis concolor coryi*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Mammals
4. Species Status: Stable
5. Recovery Priority: 6C
6. Recovery Plan Title: Florida Panther Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/June 22, 1987
9. Recovery Objective/Criteria: Downlist/ To achieve a minimum of three viable, self-sustaining populations within the historic range of the animal.
10. Major Activity Since Last Report: June 1989 acquisition of 25,000 acres for Florida Panther National Wildlife Refuge. Development of population viability analysis and species survival plan. Field investigations and studies are continuing. Ten new panthers were radio-instrumented this year, with a total of 22 that are now tracked. An artificial insemination study was initiated by the National Zoo.
11. Major Activity Over Next Reporting Period: Implementation of plan. A decision will be made regarding the establishment of a captive population. Enhance continuation of Florida Game and Fresh Water Fish Commission (Section 6). Implementation of habitat management and enhancement actions at the Florida Panther National Wildlife Refuge.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Restricted to southern Florida, fewer than 50 Florida panthers remain in the wild. In June 1989, the Fish and Wildlife Service established the Florida Panther National Wildlife Refuge to increase the habitat available to support panthers and other endangered species.

Utah prairie dog

31

1. Species: Utah prairie dog (*Cynomys parvidens*)
2. Listing/Date: Threatened/May 29, 1984
3. Group: Mammals
4. Species Status: Improving
5. Recovery Priority: 14
6. Recovery Plan Title: Utah Prairie Dog Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: A
9. Recovery Objective/Criteria: Delist—For 5 consecutive years, establish and maintain 3 populations on public lands with a minimum number of 813 animals each as counted in spring censuses.
10. Major Activity Since Last Report: A proposed amendment to a special rule to expand the prairie dog control program to cover the entire range of this species was published in the *Federal Register* in February 1990. An agency review draft of the recovery plan has been prepared. A strategic plan for species' management outlining needed recovery management goals has been completed by the State of Utah. While the total population reached 9,200 adults in spring of 1989, only 34% occurred on public lands and there are still not any populations at the minimum size for delisting on public lands. The range of this species continues to expand as a result of transplantation and natural population increase. This increase may be only temporary, a result of recent mild winters in Utah. Population densities are increasing to the point where a crash is imminent due to an outbreak of plague.
11. Major Activity Over Next Reporting Period: The final amendment of the special rule will be published.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Sonoran pronghorn

32

1. Species: Sonoran pronghorn (*Antilocapra americana sonoriensis*)
2. Listing/Date: Endangered/Listed March 11, 1967; June 2, 1970
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Sonoran Pronghorn Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/December 30, 1982
9. Recovery Objective/Criteria: Increase U.S. population to 300 or numbers feasible for the habitat.
10. Major Activity Since Last Report: Extension of Arizona Game and Fish Department monitoring of U.S. population and completion of draft Final Report 14-16-009-1564 R.W.O. #6 "Sonoran Pronghorn Habitat Utilization in Southwestern Arizona," Keith S. Hughes, Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona, Tucson, Arizona.
11. Major Activity Over Next Reporting Period: Convene a meeting of knowledgeable professionals in the fall of 1990 to evaluate recent information.
12. Recovery Achieved: 1
13. Information Current as of: July 30, 1990

33 Lower Keys rabbit

1. Species: Lower Keys rabbit (*Sylvilagus palustris hefneri*)
2. Listing/Date: Endangered/June 21, 1990
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Initiate draft recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

34 Fresno kangaroo rat

1. Species: Fresno kangaroo rat (*Dipodomys nitratoides exilis*)
2. Listing/Date: Endangered/January 30, 1985
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Recovery Plan for the Fresno Kangaroo Rat
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A/June 8, 1988
9. Recovery Objective/Criteria: Establishment of 3 independent Fresno kangaroo rat reserves of at least 1,500 contiguous acres each. Each reserve must be managed to support at least 3,000 Fresno kangaroo rats for at least 5 consecutive years before downlisting can be considered.
10. Major Activity Since Last Report: Survey of potential habitats in Madera County for species distribution and presence.
11. Major Activity Over Next Reporting Period: Acquisition of Fresno kangaroo rat habitat.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Giant kangaroo rat

35

1. Species: Giant kangaroo rat (*Dipodomys ingens*)
2. Listing/Date: Endangered/January 5, 1987
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Surveys of extant habitat for species presence and distribution. Acquisition of giant kangaroo rat habitat in Kern and San Luis Obispo Counties.
11. Major Activity Over Next Reporting Period: Continuation of #10. Initiation of Recovery Plan preparation.
12. Recovery Achieved: 2
13. Information Current as of: August 23, 1990

Morro Bay kangaroo rat

36

1. Species: Morro Bay kangaroo rat (*Dipodomys heermanni morroensis*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Morro Bay Kangaroo Rat Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/October 18, 1982
9. Recovery Objective/Criteria: Downlist Criteria: Preservation and management of land sufficient to assure a population of at least 2,500 animals and maintenance of that population level for 3 years. Downlisting is the recovery objective of the 1982 Recovery Plan. Since 1982, this subspecies has declined significantly. A more reasonable objective, at this time, is to stabilize the population.
10. Major Activity Since Last Report: Unsuccessful captive breeding effort at the Piedras Blancas, California, Research Station. Now laying groundwork for renewed captive breeding effort at the Smithsonian Institution's National Zoological Park. Undertaking a survey of sites that may be suitable for reintroduction of translocated and/or captively bred animals. None of the above activities have, as yet, had a discernable effect on the status of this subspecies.
11. Major Activity Over Next Reporting Period: Transfer the captive colony to the National Zoological Park for captive breeding. Continue to assess the extent of the remaining wild population and the status of existing and potential habitat.
12. Recovery Achieved: 1
13. Information Current as of: July 20, 1990

37 Stephens' kangaroo rat

1. Species: Stephens' kangaroo rat (*Dipodomys stephensi*)
2. Listing/Date: Endangered/September 30, 1988
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/FY 91
9. Recovery Objective/Criteria: To set up a system of viable preserves within the historic range of the animal.
10. Major Activity Since Last Report: An interim short-term habitat conservation plan (HCP) was approved by the Service that will initiate the development of preserve sites.
11. Major Activity Over Next Reporting Period: Monitoring the short-term habitat conservation plan while developing the long-term HCP.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

38 Tipton kangaroo rat

1. Species: Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*)
2. Listing/Date: Endangered/July 8, 1988
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/FY 91
9. Recovery Objective/Criteria: None established as of yet.
10. Major Activity Since Last Report: Surveys of extant habitat for species presence and distribution. Acquisition of Tipton kangaroo rat habitat in Kern and Tulare Counties.
11. Major Activity Over Next Reporting Period: Continuation of #10. Initiation of Recovery Plan preparation.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Dismal Swamp southeastern shrew

39

Species: Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*)

Listing/Date: Threatened/September 26, 1986

Group: Mammals

Species Status: Improving

Recovery Priority: 9

Recovery Plan Title: NA

Lead Region/Region Responsible for Recovery Plan: Region 5

Recovery Plan Stage/Date: NA

Recovery Objective/Criteria: NA

10. Major Activity Since Last Report: Study of relationships with *S. l. longirostris* initiated. This study will provide data on genetic threats to *S. l. fisheri* and on ecological differentiation between the two taxa. Results should indicate whether or not delisting is appropriate.

11. Major Activity Over Next Reporting Period: The study mentioned above will continue for 1-2 years. In addition, surveys will be conducted to more fully determine the occupied range.

12. Recovery Achieved: 3

13. Information Current as of: July 1990

Carolina northern flying squirrel

40

Species: Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*)

Listing/Date: Endangered/July 1, 1985

Group: Mammals

Species Status: Stable

Recovery Priority: 6C

Recovery Plan Title: Recovery Plan for the Appalachian Northern Flying Squirrels

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: F/September 24, 1990

Recovery Objective/Criteria: Downlisting to Threatened status will be possible when it can be documented that: 1) populations at all historic localities are present and stable or expanding, on the basis of annual monitoring over a 10-year period; 2) at least 2 additional stable centers of distribution of each subspecies are found to exist in the Southern Appalachians; 3) the habitats of all major centers of distribution are permanently protected; and 4) sufficient ecological data have been accumulated to ensure future protection and management.

10. Major Activity Since Last Report: The Service, along with other involved Federal and state agencies, is working to delineate occupied and potential habitat for this species. One additional population has been located in North Carolina; known populations are being monitored by use of nest box checks and live trapping, and ecological studies are ongoing. Interim habitat guidelines have been developed for the U.S. Forest Service in North Carolina and Tennessee, and habitat is being protected through review of proposed timber sales and stand treatments on National Forests; workshops on species biology and management have been presented to state and Federal foresters, game managers and other interested persons.

11. Major Activity Over Next Reporting Period: Life history work and monitoring will continue along with surveys of potential habitat to locate additional populations

12. Recovery Achieved: 2

13. Information Current as of: June 1990

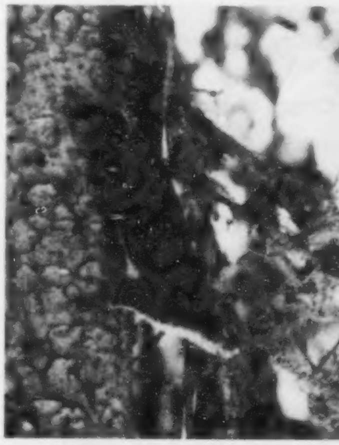
41 Delmarva Peninsula fox squirrel

1. Species: Delmarva Peninsula fox squirrel (*Sciurus niger cinereus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Mammals
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Delmarva Peninsula Fox Squirrel Recovery Plan (First Revision)
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: R/Rev/May 9, 1983
9. Recovery Objective/Criteria: Delist/Can occur when, in addition to the downlisting criteria, 5 new colonies are established outside the remaining natural range, which are stable or expanding for at least 5 years and are permanently protected. Downlisting can occur when ecological and distributional data needed for effective management are obtained, when selected populations are shown to be stable or expanding for 5 years, when 10 new colonies are established throughout the historic range, and when protection of the squirrels and their habitat is ensured.
10. Major Activity Since Last Report: 1) Squirrel translocations. 2) Population studies, which indicate that populations have been very stable since 1971. 3) Studies to determine what constitutes optimal habitat and use of suboptimal habitat. 4) Substantial progress has been made on revision of the recovery plan.
11. Major Activity Over Next Reporting Period: Completion of the revised recovery plan, continued studies, and continued pop lation monitoring. Also, initiati of a study of genetic parameters of this species relative to other subspecies.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

The Fish and Wildlife Service reintroduced an experi mental population of Delmarva fox squirrels into Suss County, Delaware in 1984. The new population is doi quite well.

42 Mt. Graham red squirrel

1. Species: Mt. Graham red squirrel (*Tamiasciurus hudsonicus grahamensis*)
2. Listing/Date: Endangered/June 3, 1987
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 9C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Spring census of population accomplished. Forest Service currently surveying remainder of habitat to locate any additional animals.
11. Major Activity Over Next Reporting Period: Recovery team will work on recovery plan. Emergency Measures Group will evaluate captive propagation and other strategies.
12. Recovery Achieved: 1
13. Information Current as of: July 1990



The Mt. Graham red squirrel is endangered due to its very restricted range i the Pinaleno Mountains.

Virginia northern flying squirrel

43

1. Species: Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*)
2. Listing/Date: Endangered/July 1, 1985
3. Group: Mammals
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Northern Flying Squirrel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/September 24, 1990
9. Recovery Objective/Criteria: Downlist / Can occur when populations at all historic localities are stable or expanding for 10 years, when 2 additional stable centers of distribution are found in the southern Appalachians, when habitats are permanently protected, and when sufficient ecological data have been accumulated to ensure future protection and management.
10. Major Activity Since Last Report: Numerous new captures at sites show the species to be much more abundant than thought, although no range extension has been found. An ecology and distribution study, and habitat protection and management (primarily Section 6 activities), have been the main recovery activities.
11. Major Activity Over Next Reporting Period: Establishment of new populations and monitoring of known populations.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Amargosa vole

44

1. Species: Amargosa vole (*Microtus californicus scirpensis*)
2. Listing/Date: Endangered/November 15, 1984
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Recovery Plan for the Amargosa Vole
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: TA/1987
9. Recovery Objective/Criteria: Extant wetland habitats utilized by the Amargosa vole and the water sources necessary for perpetuating these sources must be protected. Threatened status could be considered when these habitats and water sources have been secured and managed to maintain self-sustaining Amargosa vole populations for 10 consecutive years.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Design surveys to accurately determine the distribution of Amargosa vole populations.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

45

Hualapai Mexican vole

1. Species: Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*)
2. Listing/Date: Endangered/October 1, 1987
3. Group: Mammals
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Hualapai Mexican Vole Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: TA
9. Recovery Objective/Criteria: Stabilize
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Complete recovery plan
12. Recovery Achieved: 1
13. Information Current as of: July 1990

46

Eastern timber wolf

1. Species: Eastern timber wolf (*Canis lupus lycaon*)
2. Listing/Date: Endangered/March 11, 1967; reclassified as threatened in Minnesota March 9, 1978.
3. Group: Mammals
4. Species Status: Improving (except in Minnesota where it is 9C)
5. Recovery Priority: 6C
6. Recovery Plan Title: Recovery Plan for the Eastern Timber Wolf
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: R/F/June 5, 1978
9. Recovery Objective/Criteria: Delist. The subspecies can be considered for delisting when 1) the permanent survival of the species is ensured in Minnesota by habitat improvement and legal protection, and 2) at least one viable population is re-established and protected outside Minnesota and Isle Royale. (These criteria are expected to remain unchanged in the revised plan.)
10. Major Activity Since Last Report: The draft revised recovery plan was released for agency and public review, eliciting approximately 50 comment letters from agencies and organizations, and several hundred letters from individuals. Minnesota Department of Natural Resources has developed a 1988-89 population estimate of 1,550-1,750 wolves within the state, exceeding the state's population goals expressed in the draft recovery plan. The Wisconsin population was estimated at 29 wolves during the winter of 1989-90 and the Michigan Upper Peninsula population is believed to be around 10. The recovery plan draft states a goal of 100 wolves for a second population. Isle Royale has approximately 13 wolves. Wolf depredation on livestock has reached a record high level in all management zones in Minnesota. Depredation control funding (from U.S. Department of Agriculture/Animal Plant Health Inspection Service/Animal Damage Control) ran out in early July but was increased by internal reprogramming. Wolf sightings in zone 5 (designated as a "no wolf" zone in the original and draft recovery plans) have dramatically increased, and two wolves have been sighted in eastern North Dakota. A wolf depredation incident (a bobcat-tracking hound) was verified in Wisconsin. Formal Section 7 consultation was initiated for the proposed upgrading of Wisconsin Highway 53, possibly becoming a barrier to wolf movements between the Minnesota and Wisconsin populations. An International Wolf Symposium was held in St. Paul, Minnesota, attracting wolf experts from around the world. A public attitudes survey was carried out in Michigan, with the results, and management recommendations, expected to be available to natural resource agencies shortly.
11. Major Activity Over Next Reporting Period: Law enforcement will continue to investigate reports of illegal wolf killing. Section 7 consultation will conclude on the upgrading of Wisconsin Highway 53. The draft recovery plan will be revised by the recovery team, and possibly released as another draft, depending upon the extent of revision. Wolf depredation control will continue, but again may experience a funding shortfall due to the increasing number of depredation incidents. Research in Minnesota by Dr. Mech will continue. The recommendations of the Michigan public attitudes survey will be implemented.
12. Recovery Achieved: 3
13. Information Current as of: July 26, 1990

Mexican gray wolf 47

Species: Mexican gray wolf (*Canis lupus baileyi*)

Listing/Date: Endangered/March 11, 1967

Group: Mammals

Species Status: Improving (in captivity); wild populations extirpated in U.S. and possibly in Mexico also

Recovery Priority: 6C

Recovery Plan Title: Mexican Wolf Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 2

Recovery Plan Stage/Date: F/September 15, 1982

9. Recovery Objective/Criteria: Reintroduce into wild. Maintain a captive breeding program and reestablish a population of at least 100 Mexican wolves within historic range.

10. Major Activity Since Last Report: Increased captive populations. Interior and Defense Departments are defendants in a lawsuit filed by conservation groups because wolves have not been reintroduced on White Sands Missile Range. Fish and Wildlife Service is exploring additional candidate reintroduction locations with Arizona Game and Fish Department. Fish and Wildlife Service has made available to the public a slide/tape presentation on biology, history, and status of the Mexican wolf. Steps have been taken to establish a full-time Mexican Wolf Recovery Coordinator position.

11. Major Activity Over Next Reporting Period: Further increase size of captive population; pursue possibility of reintroducing Mexican wolves on White Sands Missile Range and other suitable locations.

12. Recovery Achieved: 1

13. Information Current as of: September 1990

48 Northern Rocky Mountain Gray wolf

1. Species: Gray wolf (Northern Rocky Mountain population) (*Canis lupus irremotus*)
2. Listing/Date: Endangered/June 4, 1973
3. Group: Mammals
4. Species Status: Improving
5. Recovery Priority: 3C
6. Recovery Plan Title: Northern Rocky Mountain Wolf Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Rev/August 3, 1987; F/May 38, 1980
9. Recovery Objective/Criteria: Delist when a minimum of 10 breeding pairs in each of 3 recovery areas are maintained for a minimum of 3 consecutive years.
10. Major Activity Since Last Report: The Interagency Wolf Working Group was established. A Wolf Recovery Coordinator has been hired and is stationed in Helena, Montana. Reports regarding the impacts of wolf reintroduction in Yellowstone as mandated by Congress have been completed. A wolf pack was relocated from private lands into Glacier National Park in September 89; however, only the adult female survived. A wolf pack (the Alpha female being the same relocated female above) was discovered in 1990 on private lands northwest of Missoula, Montana. Both adults died (the female illegally shot and the male hit by a vehicle) and deer carcasses are being provided to feed the pups until they can survive on their own. The number of wolves in and adjacent to Montana on June 1, was estimated to be about 68 animals in 6 packs. At least four dens in Montana produced pups in 1990. Two or three wolf packs have been discovered in the Cascade Range in Washington. Wolves have responded to howling surveys in Idaho, and numerous wolf sightings have been reported from the public. In time, confirmation of wolf breeding in Idaho is anticipated.
11. Major Activity Over Next Reporting Period: Monitoring of the orphaned pups will continue to determine survival, dispersal, and pack establishment in the unusual situation of having a pack of orphaned pups. This situation could provide an excellent opportunity to determine the potential success of reintroduction of young wolves. The three phase monitoring strategy will continue in Montana to detect, confirm, and monitor wolf pack distribution. The Forest Service and the Fish and Wildlife Service are planning a monitoring program to determine the status of the wolf in the Cascades. Efforts will continue to identify additional packs in new areas, to determine proper translocation procedures, and to resolve livestock/wolf conflicts in both the Rocky Mountain and the Cascade Ranges.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Extirpated from the northern Rocky Mountains in the U.S. in the 1900's, wolves are returning from Canada to occupy two of the three designated wolf recovery areas. The Fish and Wildlife Service is investigating the potential for reintroducing wolves into Yellowstone National Park as an experimental population.

Red wolf

49

Species: Red wolf (*Canis rufus*)

Listing/Date: Endangered/March 11, 1967

Group: Mammals

Species Status: Improving

Recovery Priority: 5C

Recovery Plan Title: Red Wolf (*Canis rufus*) Recovery and Species Survival Master Plan

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: R/F/July 12, 1982

Recovery Objective/Criteria: To preserve 80 to 90 percent of the genetic diversity of the species. To develop strategies that will lead to a captive population of approximately 330 animals and a wild population of approximately 220 animals. To maintain the red wolf in perpetuity through cryogenic preservation of sperm and embryo banking.

10. Major Activity Since Last Report: Wild pups were reared on Horn Island, a coastal barrier island off the coast of Mississippi, for restocking purposes. An attempt is ongoing in southwestern Louisiana to capture wolf-like animals on the chance some pure red wolf genetic material remains. If found, the animals would be added to the captive breeding program. During January 1990, a pair of red wolves were brought to St. Vincent National Wildlife Refuge, Florida, to begin the third island propagation project. Two pups were subsequently born on the island in captivity, and the family unit will be released into the wild on July 25, 1990. Two litters of pups were born in the wild at Alligator River National Wildlife Refuge, North Carolina. In addition, two family units reared in captivity and acclimated on the refuge will be released this fall. A second major reintroduction project is underway in the Great Smoky Mountains National Park, North Carolina and Tennessee. Several pairs of red wolves will be brought to the park in January, 1991 to begin a 5- to 6-month acclimation process. The release of one of these pairs and their offspring will signal the initiation of the first phase of a study that will hopefully lead to a formal reintroduction in FY 1992.

11. Major Activity Over Next Reporting Period: Completion and issuance of red wolf recovery-species survival plan; initiation of first phase of reintroduction strategy in the Great Smoky Mountains National Park; improvements in artificial insemination techniques, and expansion of cryopreservation.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

Key Largo woodrat

50

Species: Key Largo woodrat (*Neotoma floridana smalli*)

Listing/Date: Endangered/September 21, 1983

Group: Mammals

Species Status: Stable

Recovery Priority: 3C

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: U

Recovery Objective/Criteria: To be developed.

10. Major Activity Since Last Report: Land Acquisition by state continues. Department of Natural Resources doing survey work on Lignum Vitae Key, where species is believed to be exterminated.

11. Major Activity Over Next Reporting Period: Possibly more land acquisition.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

Appendix IV. Birds

Hawaii ‘akepa

51

1. Species: Hawaii ‘akepa (*Loxops coccineus coccineus*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Stable (some populations may be declining)
5. Recovery Priority: 9
6. Recovery Plan Title: Hawaii Forest Bird Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/February 3, 1983
9. Recovery Objective/Criteria: Downlist to threatened status once the population occupies 90% of the 1983 range and once the habitat and population are determined to be stable.
10. Major Activity Since Last Report: Progress at the newly established Hakalau Forest National Wildlife Refuge includes fencing, feral animal control, exotic vegetation control, and forest bird surveys and studies. Negotiations to add 1,050 acres to the refuge continue. A full-time realty position has been established and filled in Honolulu. Negotiations are underway to acquire or secure Keahou-Kilauea (Bishop Estate) and Humu'ula-Pi'ihonua (Hawaiian Home Lands). A cooperative agreement has been signed with the State Department of Corrections to develop a management plan at Kulani. “Limiting factors” studies by the U.S.Fish and Wildlife Service (Research) continue. Forest at the newly established State Puu Waawaa Reserve continues to regenerate rapidly after the removal of cattle.
11. Major Activity Over Next Reporting Period: Securing and managing habitat remains a priority. Surveys and limiting factors research will continue.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

Maui ‘akepa

52

1. Species: Maui ‘akepa (*Loxops coccineus ochraceus*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Maui/Molokai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/May 30, 1984
9. Recovery Objective/Criteria: To restore viable populations to nonendangered status within essential habitat areas defined in the recovery plan. The key goals focus on the stabilization and restoration of essential habitat.
10. Major Activity Since Last Report: Fencing and control of feral ungulates began at the Hanawi Natural Area Reserve (State). The National Park Service continues feral animal control and exotic vegetation control at Haleakala National Park, as does The Nature Conservancy at its Waikamoi Preserve.
11. Major Activity Over Next Reporting Period: Management of habitat will continue. It may not be possible to recover this species, which is at critically low numbers, without research to determine the biological factors limiting the population. Such research is identified as a recovery action item, but there are no imminent plans to conduct this research on Maui. Limiting factors research is being conducted on the Big Island of Hawaii that may be applicable to this species on Maui.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

53

Kauai ‘akialoa

1. Species: Kauai ‘akialoa (*Hemignathus procerus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Unknown (probably extinct)
5. Recovery Priority: 5
6. Recovery Plan Title: Kauai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/July 29, 1983
9. Recovery Objective/Criteria: Downlist to threatened when the population reaches 1,000 individuals.
10. Major Activity Since Last Report: A forest bird survey was conducted in 1989, but no akialoa were recorded. The species is probably extinct; there have been no sightings since 1965.
11. Major Activity Over Next Reporting Period: Protection of primary habitat on Kauai will continue.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

54

‘Akiapolaau

1. Species: ‘Akiapolaau (*Hemignathus wilsoni*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable (some populations may be declining)
5. Recovery Priority: 2
6. Recovery Plan Title: Hawaii Forest Bird Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/February 3, 1983
9. Recovery Objective/Criteria: Downlist to threatened status once the population occupies 90% of the 1983 range, and once the habitat and population are determined to be stable.
10. Major Activity Since Last Report: Progress at the newly established Hakalau Forest National Wildlife Refuge includes fencing, feral animal control, exotic vegetation control, and forest bird surveys and studies. Negotiations to add 1,050 acres to the refuge continue. A full-time realty position has been established and filled in Honolulu. Negotiations continue to acquire or secure Keahou-Kilauea (Bishop Estate) and Humu'ula-Pi'ihonua (Hawaiian Home Lands). A cooperative agreement has been signed with the State Department of Corrections to develop a management plan at Kulani. A study of the life history of akiapola'au has been initiated by Dr. Thane Pratt, and "limiting factors" studies by the U.S. Fish and Wildlife Service (Research) continue. Mamane forest on Mauna Kea continues to regenerate rapidly after the removal of sheep. Reforestation and control of introduced plants is being done or studied by the U.S. Forest Service, U.S. National Park Service, and U.S. Department of Agriculture.
11. Major Activity Over Next Reporting Period: Securing and managing habitat remains a priority. Surveys and limiting factors research will continue.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

Yellow-shouldered blackbird

55

1. Species: Yellow-shouldered blackbird (*Agelaius xanthomus*)
2. Listing/Date: Endangered/November 19, 1976
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 2C
6. Recovery Plan Title: Yellow-Shouldered Blackbird Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/May 25, 1983
9. Recovery Objective/Criteria: Downlist. Maintain a minimum of 2 distinct populations of at least 250 pairs at Roosevelt Roads Naval Station and 1,000 pairs in southwestern Puerto Rico. Maintain a minimum population of at least 250 pairs at Mona Island.
10. Major Activity Since Last Report: Cowbird control; provision of artificial nest structures; censuses; monitoring of reproductive success; control of competition for nest sites from Caribbean martin; studies of possible impacts of pesticides.
11. Major Activity Over Next Reporting Period: Continue major activities listed above.
12. Recovery Achieved: 1
13. Information Current as of: July 6, 1990

Masked bobwhite

56

1. Species: Masked bobwhite (*Colinus virginianus ridgwayi*)
2. Listing/Date: Endangered/March 11, 1967; June 2, 1970
3. Group: Birds
4. Species Status: Improving on Buenos Aires National Wildlife Refuge; declining in Mexico
5. Recovery Priority: 6
6. Recovery Plan Title: Masked Bobwhite Recovery Plan 1984
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Rev/March 16, 1984
9. Recovery Objective/Criteria: Establish three or more self-sustaining masked bobwhite populations in Arizona; maintain and/or reestablish one or more viable populations of masked bobwhite in Sonora, Mexico; conduct education programs designed to gain needed support for the protection and restoration of the masked bobwhite.
10. Major Activity Since Last Report: Recovery efforts on the Buenos Aires Refuge have focused on the reintroduction program and habitat improvement. Approximately 7,500 bobwhites have been released on the refuge since 1985. The release of an additional 2,500 bobwhites on the refuge is planned for 1990. Prescribed burns to improve habitat were conducted. Field work in Mexico was also conducted in cooperation with El Centro Ecologico de Sonora.
11. Major Activity Over Next Reporting Period: Continue the reintroduction program and monitor results. Identify preferred habitat and implement appropriate management.
12. Recovery Achieved: 2
13. Information Current as of: July 23, 1990

57. Guam broadbill

1. Species: Guam broadbill (*Myiagra freycineti*)
2. Listing/Date: Endangered/August 27, 1984
3. Group: Birds
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Guam Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Find and capture any surviving individuals for captive propagation after the brown tree snake is controlled or eradicated. Note: There has only been one voice record of this species in the last 3 years; it is probably near extinction or is already extinct.
10. Major Activity Since Last Report: Drafted proposal for critical habitat designation.
11. Major Activity Over Next Reporting Period: Propose critical habitat designation on Guam.
12. Recovery Achieved: 1
13. Information Current as of: September, 1990

58 Audubon's crested caracara

1. Species: Audubon's crested caracara (*Polyborus plancus audubonii*)
2. Listing/Date: Threatened/July 6, 1987
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 12
6. Recovery Plan Title: Audubon's Crested Caracara Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 14, 1989
9. Recovery Objective/Criteria: Delist/ The species may be delisted once the following criteria are met: The population is stable, or increasing from, the current population level. Active territories are still found in, and have expanded from the current five-county distribution core. The amount of nesting and foraging habitat needed to maintain the stable or expanding population and distribution is secured through acquisition, conservation easements, etc.
10. Major Activity Since Last Report: Completion of recovery plan. In a project funded by the Florida Game and Fresh Water Fish Commission, Archbold Biological Station surveyed all known nesting territories to document distribution. Total population is estimated at a minimum of 500 birds.
11. Major Activity Over Next Reporting Period: None anticipated
12. Recovery Achieved: 1
13. Information Current as of: July 1990

California condor

59

Species: California condor (*Gymnogyps californianus*)

Listing/Date: Endangered/March 11, 1967

Group: Birds

Species Status: Improving (Captive Propagation)

Recovery Priority: 1C

Recovery Plan Title: California Condor Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: R/Rev/July 31, 1984

Recovery Objective/Criteria: Downlist/The species could be considered for reclassification to threatened when three discrete, self-sustaining populations of 100 adult condors each are established.

10. Major Activity Since Last Report: Since 1987, the population has been in captivity at the Los Angeles Zoo and San Diego Wild Animal Park. Comparable genetic, age and sex representation is maintained at each facility to minimize the impact of a catastrophic loss at one facility. Since 1988, successful captive breeding has increased the species' productivity. Establishment and refinement of release criteria and techniques for the reintroduction of California condors is ongoing based on the release of surrogate Andean condors.

11. Major Activity Over Next Reporting Period: Manage captive population to continue to optimize productivity and genetic diversity. Continue to monitor the experimentally released Andean condor population to evaluate and refine release techniques, and develop a comprehensive plan for the release and reintroduction of California condors. Continue the development and implementation of management plans to protect known suitable nesting sites, roosting sites and foraging habitat within recent historical condor range. Continue investigations on environmental contaminants, potential predators, and man-made sources of collision effect on condor and related surrogate species survival and reproduction.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

Hawaiian coot

60

Species: Hawaiian coot (*Fulica americana alai*)

Listing/Date: Endangered/October 13, 1970

Group: Birds

Species Status: Stable

Recovery Priority: 15

Recovery Plan Title: Hawaiian Waterbirds Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: Rev/September 11, 1985

Recovery Objective/Criteria: To delist by maintaining a population of at least 2,000, as distributed in 1976, in the habitat types.

10. Major Activity Since Last Report: A full-time realty position has been established and filled in Honolulu. Negotiations continue to secure wetland habitat around James Campbell National Wildlife Refuge (NWR) on Oahu and at Kealia on Maui. Resource agencies continue to pursue the licensing of diphasinone for predator control. Ownership of Kawainui Marsh on Oahu was transferred from the City and County of Honolulu to the State for management by the Division of Land and Natural Resources. Biannual waterbird surveys continue.

11. Major Activity Over Next Reporting Period: Surveys will continue. Additions to James Campbell NWR should be finalized. Kealia should become part of the National Wildlife Refuge System. Management of Kawainui for waterbirds should begin. The creation of wetland habitat at Mana on Kauai should begin.

12. Recovery Achieved: 3

13. Information Current as of: August 1990

61

Mississippi sandhill crane

1. Species: Mississippi sandhill crane (*Grus canadensis pulla*)
2. Listing/Date: Endangered/June 4, 1973
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 6C
6. Recovery Plan Title: Mississippi Sandhill Crane Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/June 29, 1984
9. Recovery Objective/Criteria: Downlist. To reclassify the Mississippi sandhill crane will require cessation of captive propagation, attaining a minimum effective population of 200 cranes in the wild, and attaining at least 30 active nests (60 breeding cranes) per year for a period of 10 years.
10. Major Activity Since Last Report: Major recovery activities include intense habitat management (forest clearing and burning) to promote the original savanna habitat; release of captive raised cranes to bolster the wild population (as of 1989, 96 cranes had been released); and continued research in possible environmental and genetic problems that may be hindering wild crane reproduction.
11. Major Activity Over Next Reporting Period: Recovery efforts will include habitat management to promote savannas, continued release of captive raised cranes, reestablishment of natural genetic interchange among non-migratory southeastern sandhill cranes, and continued research into possible environmental problems on and near the Mississippi Sandhill Crane National Wildlife Refuge.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

62

Whooping crane

1. Species: Whooping crane (*Grus americana*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 2C
6. Recovery Plan Title: Whooping Crane Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Rev/December 23, 1986; F/January 1, 1980
9. Recovery Objective/Criteria: Downlist/Increase wild population to 90 nesting pairs by 2020.
10. Major Activity Since Last Report: Splitting of captive flock and establishment of flock at International Crane Foundation. Natural flock continues to increase modestly.
11. Major Activity Over Next Reporting Period: Continue captive production for possible eventual release in Florida. Establishment of a captive flock in Canada.
12. Recovery Achieved: 2
13. Information Current as of: July 31, 1990

Hawaiian creeper 63

Species: Hawaiian creeper (*Oreomystis mana*)

Listing/Date: Endangered/September 25, 1975

Group: Birds

Species Status: Stable (some populations may be declining)

Recovery Priority: 8

Recovery Plan Title: Hawaiian Forest Birds Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: F/May 1983

Recovery Objective/Criteria: Downlist to threatened status once the population occupies 90% of the 1983 range and once the habitat and population are determined to be stable.

10. Major Activity Since Last Report: Progress at the newly established Hakalau Forest National Wildlife Refuge includes fencing, feral animal control, exotic vegetation control, and forest bird surveys and studies. Negotiations to add an additional 1,050 acres to the refuge continue. A full-time realty position has been established and filled in Honolulu. Negotiations continue to acquire or secure Keahou-Kilauea (Bishop Estate) and Humu'ula-Pi'ihonua (Hawaiian Home Lands). A cooperative agreement has been signed with the State Department of Corrections to develop a management plan at Kulani. "Limiting factors" studies by the U.S. Fish and Wildlife Service (Research) continue. Forest at the newly established State Puu Waawaa Reserve continues to regenerate rapidly after the removal of cattle.

11. Major Activity Over Next Reporting Period: Securing and managing habitat remains a priority. Surveys and limiting factors research will continue.

12. Recovery Achieved: 2

13. Information Current as of: August 1990

Molokai creeper 64

Species: Molokai creeper (= kakawahie) (*Oreomystis flammea*)

Listing/Date: Endangered/October 13, 1970

Group: Birds

Species Status: Declining

Recovery Priority: 5

Recovery Plan Title: Maui/Molokai Forest Birds Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: F/March 13, 1985

9. Recovery Objective/Criteria: To restore viable populations to nonendangered status within essential habitat areas defined in the recovery plan. The key goals focus on the stabilization and restoration of essential habitat.

10. Major Activity Since Last Report: Fencing and control of feral ungulates began at the State Natural Area Reserve on the Waikolu Plateau. The National Park Service continued to work on establishment of a National Park at Kalaupapa. The Nature Conservancy (TNC) has established and is beginning to manage two large reserves, Pelekunu Valley and Kamako. Preliminary results of a forest bird survey conducted in 1988 are completed. The State began management of Olokui Plateau.

11. Major Activity Over Next Reporting Period: Management of habitat will continue. No Molokai creepers were sighted during the 1988 survey, and this species may be extinct.

12. Recovery Achieved: 1

13. Information Current as of: August 1990

65 Oahu creeper

1. Species: Oahu creeper (= alauwahio) (*Paroreomyza maculata*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: The State of Hawaii has proposed to conduct a forest bird survey of Oahu in 1991.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

66 Hawaiian crow

1. Species: Hawaiian crow (= 'alala) (*Corvus hawaiiensis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining (Critically low)
5. Recovery Priority: 2
6. Recovery Plan Title: Alala Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/August 12, 1985
9. Recovery Objective/Criteria: To remove the species from the threatened and endangered species list by securing adequate and optimum habitat within the species range and by increasing the wild population to a minimum of 400 birds.
10. Major Activity Since Last Report: The captive flock at Olinda, Maui, has fewer than a dozen birds, with only two functional breeding pairs. One chick was produced in 1989 and another was produced in 1990. A flock of 9 wild birds was recorded on private property (McCandless Ranch) in November 1989. A mongoose trapping program was initiated during the 1990 breeding season on McCandless Ranch. As of July 1990, at least one wild young bird fledged in this area. More active management of the wild population has not been possible because access has been denied to State and Federal biologists. There have been numerous meetings and negotiations with private landowners to remedy this situation. One wild bird was sighted on the State sanctuary at Puu Waawaa. The State has placed an additional 1,400 acres in forest reserve status along the Kona Coast.
11. Major Activity Over Next Reporting Period: Maintenance and management of the captive flock will continue. Negotiations with landowners to more actively manage habitat and the wild flock will continue. Attempts to add genetic material from the wild flock to the captive flock will continue.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Mariana crow 67

1. Species: Mariana crow (*Corvus kubaryi*)
2. Listing/Date: Endangered/August 27, 1984
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Guam Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Control and/or eradicate the brown tree snake on Guam, maintain approximately 700 crows on Rota, and restore the Guam population to 700 crows throughout its former historic range, with 500 in Northern Guam and 200 in Southern Guam.
10. Major Activity Since Last Report: Drafted proposal for critical habitat designation. The Commonwealth of the Northern Mariana Islands' Division of Fish and Wildlife is conducting some studies of the crow on the Island of Rota. The Guam Division of Aquatic and Wildlife Resources is experimenting with snake-proofing crow nesting trees on Guam.
11. Major Activity Over Next Reporting Period: Propose critical habitat designation on Guam. Increased crow surveys on Rota in the areas proposed for major resort developments. These areas represent the best nesting habitat for this species.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Eskimo curlew 68

1. Species: Eskimo curlew (*Numenius borealis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 7
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Conducted first Eskimo Curlew Advisory Group meeting, January 10-12, 1990. Twenty six recovery action items were identified and nine priority work elements were initiated during Fiscal Year 1990. The following work elements are in progress: Status surveys in former use areas. Conduct status survey of St. Michael, Alaska, region for late summer or fall Eskimo curlew migrants. Conduct status survey of Barbados Island wetlands for fall Eskimo curlew migrants. Conduct status survey of southwest Texas coast for spring Eskimo curlew migrants. Promotion of Eskimo curlew awareness. Develop and distribute Eskimo curlew and look-alikes "Alert" brochure. Conduct literature review and a synthesis of publications concerned with recent and historical accounts of Eskimo curlew occurrences on their Latin American migrational corridors and wintering grounds.
11. Major Activity Over Next Reporting Period: Increase public awareness and coordination of Eskimo curlew observations throughout their former distributional range, particularly during the spring and fall migration periods. Continuation of curlew status surveys to determine distribution and abundance during migration.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

69

Hawaiian duck

1. Species: Hawaiian duck (= koloa) (*Anas wyvilliana*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Hawaiian Waterbirds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/September 11, 1985
9. Recovery Objective/Criteria: To delist by maintaining a population of at least 2,000, as distributed in 1976, in the habitat types.
10. Major Activity Since Last Report: Koloa from Pohakuloa moved to Olinda captive propagation facility. Genetic studies of species completed. A full-time realty position has been established and filled in Honolulu. Negotiations continue to secure wetland habitat around James Campbell National Wildlife Refuge (NWR) on Oahu and at Kealia on Maui. Resource agencies continue to pursue the licensing of diphasinone for predator control. Ownership of Kawainui Marsh on Oahu was transferred from the City and County of Honolulu to the State for management by the Division of Land and Natural Resources. The creation of wetland habitat at Mana on Kauai continues. Biannual waterbird surveys continue.
11. Major Activity Over Next Reporting Period: Surveys will continue. Additions to James Campbell NWR should be finalized. Kealia should be under the National Wildlife Refuge System. Management of Kawainui for waterbirds will begin. Results of the genetic study indicate that the gene pool is being "polluted" by Mallards, and reassessment of recovery actions may be needed.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

70

Laysan duck

1. Species: Laysan duck (*Anas laysanensis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Laysan Duck Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/May 11, 1983
9. Recovery Objective/Criteria: To downlist the species from endangered to threatened by perpetuating the Laysan duck on Laysan Island and by protecting the natural island habitat. Because of the limited habitat of Laysan Island and the vulnerability to natural and man-made catastrophes, the duck might always be considered a threatened species.
10. Major Activity Since Last Report: Laysan continues to be operated as a refuge with restricted access. Surveys have been conducted by refuge staff. A PhD thesis has been completed on Laysan Duck behavior. Refuge staff initiated an ant distribution and control study, and began investigations in the spread of sand burrs (*Cenchrus* sp.), an introduced noxious plant.
11. Major Activity Over Next Reporting Period: Ongoing studies and surveys will continue.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

Bald eagle 71

1. Species: Bald eagle (*Haliaeetus leucocephalus*)
2. Listing/Date: Endangered/March 11,1967 and threatened/February 14, 1978
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 9C except in Minnesota, Michigan, and Wisconsin where it is 15C.
6. Recovery Plan Title:

   Northern States Bald Eagle Recovery Plan F/July 29, 1983

   Chesapeake Population Rev/September 27, 1990

   Pacific States Population F/August 25, 1986

   Southeastern Population F/August 3, 1984

   Southwestern Population F/September 8, 1982
7. Lead Region/Region Responsible for Recovery Plan: Region 3/ Regions 1, 2, 3, 4, 5
8. Recovery Plan Stage/Date: See # 6
9. Recovery Objective/Criteria:

   Northern Recovery Region: No downlisting to threatened criteria currently exist. Delist: "... 1,200 occupied breeding areas distributed over a minimum of 16 states within the recovery region by the year 2000, with an average annual productivity of at least 1.0 young per occupied nest.

   Chesapeake Bay Recovery Region: Downlist to threatened, "... by sustaining a nesting population 300-400 pairs with an average productivity of 1.1 young per active nest over 5 years, and by achieving permanent protection of sufficient habitat to support this nesting population, and enough roosting and foraging habitat to support population levels commensurate with increases throughout the Atlantic recovery regions.

   Pacific States Recovery Region: Downlist to threatened, "...reclassification from endangered to threatened could be considered if nesting populations continue to increase for the next five years [beginning August 1986]. Delist based on "...1) a minimum of 800 nesting pairs in the Pacific recovery area; 2) average reproductive rate of 1.0 fledged young per pair, with an average success rate per occupied site of not less than 65%, 3) attainment of breeding population goals in at least 80% of the management zones with nesting potential, and 4) stable or increasing wintering populations."

   Southeastern States Recovery Region: Downlist to threatened at the "... documentation of 600 occupied breeding areas distributed over at least 75% of the bald eagles [sic] historic range, (9 of 12 states in the Southeast) ..., contingent upon reproductive success being greater than 0.9 young per occupied nest, greater than 1.5 young per successful nest, and at least 50% of the nests successful in raising at least one young...based on a 3-year average. There should be additional documentation of population vigor and adequate support habitat." Delisting criteria will be developed when the species is downlisted to threatened.

   Southwestern States Recovery Region: Under revision
10. Major Activity Since Last Report: Banding, occupancy and productivity surveys, habitat evaluation, nest monitoring, and reintroduction are ongoing. On February 7, 1990, the Service published an "Advance Notice of a Proposed Rule" and received comments which will be considered in reaching a decision on downlisting, reclassifying, or delisting all or specific recovery populations. Current population estimates (using 1990 breeding season survey data):

    Northern States—1,165 occupied territories—1.3 estimated average young per territory.

    Chesapeake Bay—235 occupied territories—1.4 estimated average young per territory.

    Pacific States—861 occupied territories—1.1 estimated average young per territory.

    Southeastern States—722 occupied territories—1.1 estimated average young per territory.

    Southwestern States—27 occupied territories—0.5 estimated average young per territory.

    Total—3010 occupied territories—1.2 estimated average young per territory for 1990.
11. Major Activity Over Next Reporting Period: Continue ongoing monitoring, banding, reintroduction, and habitat evaluation activities. Issue a decision about downlisting or delisting populations relative to the notice issued in 1990.
12. Recovery Achieved: 4
13. Information Current as of: September 30, 1990

72 American peregrine falcon, Alaska population

1. Species: American peregrine falcon (*Falco peregrinus anatum*), Alaska population
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 9
6. Recovery Plan Title: Peregrine Falcon Recovery Plan—Alaska Population
7. Lead Region/Region Responsible for Recovery Plan: Region 7
8. Recovery Plan Stage/Date: R/F/October 4, 1982
9. Recovery Objective/Criteria: Delist: Criteria for delisting: (1) Number of pairs occupying nesting territories in the four study areas; (2) Reproductive and mortality statistics; and (3) effects of organochlorines and other pollutants on reproduction.
10. Major Activity Since Last Report: Continue survey and monitoring program in four established study areas, and continue to measure three recovery parameters listed above for the four study areas. All criteria appear to meet or exceed recovery objectives (as written in draft revised Recovery Plan).
11. Major Activity Over Next Reporting Period: Continue activity described above to measure recovery status. Delisting will likely be proposed in the near future.
12. Recovery Achieved: 4
13. Information Current as of: July 1990

73 American peregrine falcon, Eastern States

1. Species: American peregrine falcon (*Falco peregrinus anatum*), Eastern States
2. Listing/Date: Endangered/June 2, 1970
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 15
6. Recovery Plan Title: Eastern Peregine Falcon Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Rev/June 9, 1987
9. Recovery Objective/Criteria: Delist/Self-sustaining population of a minimum of 175-200 pairs, with 20-25+ pairs in each of 5 recovery regions by 1995.
10. Major Activity Since Last Report: Aerie management and monitoring of nesting birds. The nesting population continues to increase, with 83 pairs/105 young in 1989.
11. Major Activity Over Next Reporting Period: Continued aerie management and monitoring of nesting birds.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

American peregrine falcon, Western States

74

1. Species: American peregrine falcon (*Falco peregrinus anatum*) Western States
2. Listing/Date: Endangered/June 2, 1970
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for Peregrine Falcon—Pacific Population
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/October 12, 1982
9. Recovery Objective/Criteria: 185 pairs total in CA, OR, WA, and NV for delisting, including 5 pairs in NV. Downlisting includes four management units which overlap NV and adjoining states so does not require establishment of pairs specifically in NV.
10. Major Activity Since Last Report: Annual hacking of captive-bred peregrines by Nevada Dept. of Wildlife in Ruby Valley, Spring Valley, and downtown Las Vegas.
11. Major Activity Over Next Reporting Period: Continued annual hacking of peregrines at selected sites. Addendum being developed to merge the Recovery Objective and implementation schedule into a single document.
12. Recovery Achieved: 2
13. Information Current as of: July 25, 1990

Arctic peregrine falcon

75

1. Species: Arctic peregrine falcon (*Falco peregrinus tundrius*)
2. Listing/Date: Threatened/March 20, 1984; Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 9
6. Recovery Plan Title: Peregrine Falcon Recovery Plan—Alaska Population
7. Lead Region/Region Responsible for Recovery Plan: Region 7
8. Recovery Plan Stage/Date: R/F/October 4, 1982
9. Recovery Objective/Criteria: Delist: Criteria for delisting: (1) Number of pairs occupying nesting territories in the four study areas; (2) Reproductive and mortality statistics; and (3) effects of organochlorines and other pollutants on reproduction.
10. Major Activity Since Last Report: Continue survey and monitoring program in four established study areas, and continue to measure three recovery parameters listed above for the four study areas. All criteria appear to meet or exceed recovery objectives (as written in draft revised Recovery Plan).
11. Major Activity Over Next Reporting Period: Continue activity described above to measure recovery status. Delisting will likely be proposed in the near future.
12. Recovery Achieved: 4
13. Information Current as of: July 1990

76 Northern aplomado falcon

1. Species: Northern aplomado falcon (*Falco femoralis septentrionalis*)
2. Listing/Date: Endangered/February 25, 1986
3. Group: Birds
4. Species Status: Unknown, but presumed to be declining in Mexico; extirpated in U.S.
5. Recovery Priority: 3
6. Recovery Plan Title: Aplomado Falcon Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/June 8, 1990
9. Recovery Objective/Criteria: Downlist/Prevent or minimize habitat loss pesticide contamination and human persecution.
10. Major Activity Since Last Report: Hacking and monitoring of domestic reared birds.
11. Major Activity Over Next Reporting Period: Continuation of hacking and monitoring program.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

77 Laysan finch

1. Species: Laysan finch (honeycreeper) (*Telespyza cantans*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Northwest Hawaiian Islands Passerines Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/November 19, 1985
9. Recovery Objective/Criteria: To downlist to threatened status by maintaining optimum and stable populations through the development of thorough and effective habitat protection strategies. These strategies include efforts to prevent the introduction of exotic organisms, a monitoring program to detect changes in the status of exotics, and a strategy designed to control invasion by exotics and declines in bird populations.
10. Major Activity Since Last Report: Laysan has been managed as a wildlife refuge with restricted access. Annual surveys have been conducted by refuge staff. Marie Morin, University of Hawaii graduate student, continued a study on the breeding biology of the Finch. Refuge staff initiated an ant distribution and control study, and began investigations in the spread of sand burrs (*Cenchrus* sp.), an introduced noxious plant.
11. Major Activity Over Next Reporting Period: Continuation of surveys and restricted access.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

Nihoa finch 78

1. Species: Nihoa finch (honeycreeper) (*Telespyza ultima*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Northwest Hawaiian Island Passerines Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/November 19, 1985
9. Recovery Objective/Criteria: To downlist to threatened status by maintaining optimum and stable populations through the development of thorough and effective habitat protection strategies. These strategies include efforts to prevent the introduction of exotic organisms, a monitoring program to detect changes in the status of exotics, and a strategy designed to control invasion by exotics and declines in bird populations.
10. Major Activity Since Last Report: Nihoa has been managed as a wildlife refuge with restricted access. Annual surveys have been conducted by refuge staff. Refuge staff initiated an ant distribution and control study, and began investigations in the spread of sand burrs (*Cenchrus* sp.), an introduced noxious plant. A breeding biology study by Dr. Conant, University of Hawaii, has continued.
11. Major Activity Over Next Reporting Period: Continuation of surveys and restricted access.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

79 Aleutian Canada goose

1. Species: Aleutian Canada goose (*Branta canadensis leucopareia*)

2. Listing/Date: Endangered/March 11, 1967

3. Group: Birds

4. Species Status: Improving

5. Recovery Priority: 9

6. Recovery Plan Title: Aleutian Canada Goose Recovery Plan

7. Lead Region/Region Responsible for Recovery Plan: Region 7

8. Recovery Plan Stage/Date: R/F/September 8, 1982

9. Recovery Objective/Criteria: Delist: Maintain minimum population size of 1,200 birds. In addition to the remnant Buldir Island nesting population, reestablish 50 or more self sustaining breeding pairs on three separate areas. Downlist: In addition to the Buldir Island nesting population, either (1) reestablish self-sustaining populations of 50 or more breeding pairs on two areas or (2) reestablish a total of 100 nesting pairs or more on three areas, with 10 pairs the minimum colony size.

10. Major Activity Since Last Report: Initiated proposed rule to reclassify the Aleutian Canada goose from endangered to threatened status. This change in status is warranted on the basis of marked numerical improvements of the Buldir Island segment of the Aleutian goose population in the western portion of the Aleutian Archipelago. The 7.7 square miles of Buldir Island currently sustain between 1,200 and 1,500 pairs of Aleutian geese. Field surveys conducted in the western Aleutians during 1990 show that geese transplanted from Buldir Island are currently sustained on three islands of two western Aleutian island groups. In the Near Island Group, over 50 pairs of Aleutian geese are reestablished on Agattu Island. This is an increase of 20 pairs, up from 30 pairs in 1989. Nizki-Alaid Island showed no change in goose population between 1989 and 1990, maintaining an estimated 7-9 pairs. Little Kiska Island of the Rat Island Group currently sustains two pairs of geese transplanted from Buldir Island in 1988. Conducted field surveys on Amukta and Chagulak Islands in the Islands of Four Mountain Group of the eastern Aleutians during 1990. Amukta Island sustains a single pair of geese for the second year in a row. The first comprehensive breeding pair survey of Chagulak Island was completed during 1990. The total size of the remnant population is smaller (20-25 pairs) than previous estimates (50 pairs). Conducted surveys on Kiliklagik Island. This Semidi Island Group island is the location of the eastern most remnant breeding population of Aleutian geese. Biologists estimate that the Kiliklagik nesting population is comprised of approximately 20 pairs of Aleutian geese. Trap and transplant operations are now routinely conducted with the aid of herding dogs. An annual objective to capture and transplant 150 birds is readily met with canine assistance. Today, field operations are markedly more efficient and safer than in previous years. Captured goslings and adult geese are released in the Near Island and the Rat Island Groups. Trapping, banding, and winter monitoring studies continue throughout the North Coast and Central Valley of California. Population projections for 1989-90 season exceeds 6,000 birds. This represents an approximate 10 percent increase over 1988-89.

11. Major Activity Over Next Reporting Period: Complete revision of Aleutian Canada Goose Recovery Plan. Emphasis on management strategies for remnant populations at Chagulak and Kiliktagik Islands. Trap and transplant to continue with emphasis on overcoming problems associated with reintroduction to former breeding islands. Winter monitoring to continue with banding emphasis shifted to the San Joaquin Valley to refine distribution data. Neck collars will continue to be used in conjunction with survival study of translocated Aleutian geese. Continue data entry into Aleutian goose data storage and retrieval system. Analyze 15 years of winter monitoring data to delineate population survival estimates.

12. Recovery Achieved: 3

13. Information Current as of: July 1990

Hawaiian goose

80

1. Species: Hawaiian goose (= nene) (*Nesochen sandvicensis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 4
6. Recovery Plan Title: Nene Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/August 3, 1983
9. Recovery Objective/Criteria: To establish a population of 2,000 geese on Hawaii and 250 on Maui, well distributed in secure habitat and maintained by natural reproduction so that the species may be delisted.
10. Major Activity Since Last Report: The new captive propagation facility at Olinda, Maui, has been completed and the captive flock has been moved into the facility. Young reared at this facility will be introduced into the wild. Nene breeding sanctuaries on the island of Hawaii have been maintained. The small feral population on Kauai has been growing slowly and now numbers about 35. Populations on Maui have been monitored by the National Park Service. Resource agencies continue to pursue the licensing of diphasinone for predator control.
11. Major Activity Over Next Reporting Period: Current management and captive propagation activities will continue. The State plans to study the small feral flock on Kauai. A new education and research program being funded by the Wildfowl and Wetlands Trust is now being initiated.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

Hawaiian hawk

81

1. Species: Hawaiian hawk (= io) (*Buteo solitarius*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 14
6. Recovery Plan Title: Hawaiian Hawk Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/October 4, 1984
9. Recovery Objective/Criteria: To ensure a self-sustaining population of 1,500-2,500 adult birds in the wild, as distributed in 1983, and maintained in stable, secure habitat. The species can be considered for reclassification to threatened status when the population remains at 2,000.
10. Major Activity Since Last Report: A number of areas on the Island of Hawaii are in the process of being acquired or otherwise secured for endangered forest birds. Although acquisition of habitat is not identified as a recovery action for the Hawaiian hawk, the species will likely benefit from these actions.
11. Major Activity Over Next Reporting Period: Populations of this species appear to be relatively stable. Reclassifying the Hawaiian hawk from endangered to threatened has been proposed. This listing action has not yet been pursued because of the heavy listing work load in Hawaii; it does, however, remain as a potential listing action.
12. Recovery Achieved: 4
13. Information Current as of: August 1990

82

Crested honeycreeper

1. Species: Crested honeycreeper (= 'akohekohe) (*Palmeria dolei*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 7
6. Recovery Plan Title: Maui/Molokai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 13, 1985
9. Recovery Objective/Criteria: To restore viable populations to nonendangered status within essential habitat areas defined in the recovery plan. The key goals focus on the stabilization and restoration of essential habitat.
10. Major Activity Since Last Report: Fencing and control of feral ungulates began at the Hanawi Natural Area Reserve (State). The National Park Service continues feral animal control and exotic vegetation control at Haleakala National Park, as does The Nature Conservancy (TNC) at Waikamoi Preserve.
11. Major Activity Over Next Reporting Period: Management of habitat will continue. This species appears to have healthier populations than some of the more rare forest birds on Maui, such as the Maui akepa and Maui parrotbill. Limiting factors research is being conducted on the Big Island of Hawaii that may be applicable to this species on Maui.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

83

Florida scrub jay

1. Species: Florida scrub jay (*Aphelocoma coerulescens coerulescens*)
2. Listing/Date: Threatened/June 3, 1987
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Florida Scrub Jay Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/May 9, 1990
9. Recovery Objective/Criteria: Stabilize/The population must be stable or increasing from the current population level at the three existing, large population sites. There must be documented evidence of scrub jays recolonizing restored or uninhabited areas throughout their historic range. Establishment of several scrub preserves with sufficient acreage to sustain viable scrub jay populations. Use of scrub jay habitat management guidelines by developers when proposing development in scrub habitat.
10. Major Activity Since Last Report: Initiated banding study to determine impacts of a proposed industrial park, thereby assisting in the development of the park. Section 7 consultations to reduce or prevent habitat loss. Working with Volusia County to establish mitigation land bank for scrub jays.

Endemic to Florida, the Florida scrub jay is threatened by rapid development in its limited habitat.

11. Major Activity Over Next Reporting Period: Possible development of Habitat Conservation Plans for species in Lake Wales Ridge and Brevard County. Possible redefining of the subspecies to full specific status.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Guam Micronesian kingfisher

84

1. Species: Guam Micronesian kingfisher (*Halcyon cinnamomina cinnamomina*)
2. Listing/Date: Endangered/August 27, 1984
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Guam Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Control and/or eradicate the brown tree snake on Guam; establish captive populations for transplant and reestablishment projects. Establish a wild population of at least 1500 birds; 1000 in northern Guam; 500 in southern Guam.
10. Major Activity Since Last Report: Drafted proposal for critical habitat designation. Captive propagation effort continues to be successful.
11. Major Activity Over Next Reporting Period: Propose critical habitat designation on Guam. Continue the captive propagation effort.
12. Recovery Achieved: 1
13. Information Current as of: September, 1990

Everglade snail kite

85

1. Species: Everglade snail kite (*Rostrhamus sociabilis plumbeus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 3C
6. Recovery Plan Title: Florida Snail Kite Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/September 9, 1986.
9. Recovery Objective/Criteria: Interim population goal is an annual average of 650 birds for a 10-year period with annual population declines of less than 10% of the average.
10. Major Activity Since Last Report: Mediate controversy over modified water delivery program at Everglades National Park and its impact on snail kites. Annual winter surveys continue. Last year's survey discovered 464 kites.
11. Major Activity Over Next Reporting Period: No activity anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

86 Mariana mallard

1. Species: Mariana mallard (*Anas oustaleti*)
2. Listing/Date: Endangered/June 2, 1977
3. Group: Birds
4. Species Status: Extinct
5. Recovery Priority: 5
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: NA
10. Major Activity Since Last Report: None; the Commonwealth of the Northern Mariana Islands' Division of Fish and Wildlife believes this species is extinct.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

87 Micronesian megapode

1. Species: Micronesian megapode (La Perouse's) (*Megapodius laperouse*)
2. Listing/Date: Endangered/June 2, 1970
3. Group: Birds
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Megapode surveys on Saipan indicate a few birds are still present on that island.
11. Major Activity Over Next Reporting Period: Planning on conducting a megapode population survey in Belau during 1991.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Nihoa millerbird

88

1. Species: Nihoa millerbird (old world warbler) (*Acrocephalus familiaris kingi*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Northwest Hawaiian Islands Passerines Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/November 19, 1985
9. Recovery Objective/Criteria: To downlist to threatened status by maintaining optimum and stable populations through the development of thorough and effective habitat protection strategies. These strategies include efforts to prevent the introduction of exotic organisms, a monitoring program to detect changes in the status of exotics, and a strategy designed to control invasion by exotics and declines in bird populations.
10. Major Activity Since Last Report: Nihoa has been managed as a wildlife refuge with restricted access. Annual surveys have been conducted by refuge staff. Refuge staff have initiated an ant distribution and control study, and began investigations in the spread of sand burrs (*Chenchrus* sp.), an introduced noxious plant.
11. Major Activity Over Next Reporting Period: Continuation of surveys and restricted access.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

Tinian monarch

89

1. Species: Tinian monarch (old world flycatcher) (*Monarcha takatsukasae*)
2. Listing/Date: Threatened/April 6, 1987; Endangered/June 2, 1970
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 14
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: NA
10. Major Activity Since Last Report: Micronesian bird surveys completed in 1982 and data gathered indicated population level of 40,000 birds. As a result, the species was downlisted from endangered to threatened in April 1987. It remains threatened due to the potential introduction of brown tree snake from Guam to Tinian by the Army during training exercises. If tasks in Guam Forest Birds Recovery Plan are implemented effectively, this threat will be removed.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 4
13. Information Current as of: August 1990

90 Hawaiian common moorhen

1. Species: Hawaiian common moorhen (gallinule) (*Gallinula chloropus sandvicensis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Hawaiian Waterbirds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/September 11, 1985
9. Recovery Objective/Criteria: To delist by maintaining a population of at least 2,000, as distributed in 1976, in the habitat types.
10. Major Activity Since Last Report: A full-time realty position has been established and filled in Honolulu. Negotiations continue to secure wetland habitat around James Campbell National Wildlife Refuge (NWR) on Oahu and at Kealia on Maui. Resource agencies continue to pursue the licensing of diphasinone for predator control. Ownership of Kawainui Marsh on Oahu was transferred from the City and County of Honolulu to the State for management by the Division of Land and Natural Resources. The creation of wetland habitat at Mana on Kauai continues. Biannual waterbird surveys continue.
11. Major Activity Over Next Reporting Period: Surveys will continue. Additions to James Campbell NWR should be finalized. Kealia should be under the National Wildlife Refuge System. Management of Kawainui for waterbirds will begin.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

91 Mariana common moorhen

1. Species: Mariana common moorhen (gallinule) (*Gallinula chloropus guami*)
2. Listing/Date: Endangered/August 27, 1984
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for the Mariana Common Moorhen
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A/1988—Not Approved yet
9. Recovery Objective/Criteria: Maintain/develop wetland habitat to support 600 adult birds on Guam, 300 on Saipan, and 75 on Tinian.
10. Major Activity Since Last Report: The Commonwealth of the Northern Mariana Islands' Division of Fish and Wildlife is conducting a field study and status survey of this species in the Commonwealth. The Guam Division of Aquatic and Wildlife Resources is conducting similar studies on Guam.
11. Major Activity Over Next Reporting Period: Completion of the above referenced studies.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Puerto Rican nightjar 92

1. Species: Puerto Rican nightjar (whip-poor-will) (*Caprimulgus noctitherus*)
2. Listing/Date: Endangered/June 4, 1973
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Puerto Rican Whip-poor-will Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/1984
9. Recovery Objective/Criteria: Stabilize
10. Major Activity Since Last Report: Population surveys conducted at the Guanica Forest.
11. Major Activity Over Next Reporting Period: Preliminary Project Proposal being prepared to propose the acquisition of limestone forest areas in the Guayanilla Hills. This area represents the easternmost population of the species and is presently entirely privately owned.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Nukupu'u, Kauai population 93

1. Species: Nukupu'u (honeycreeper) (*Hemignathus lucidus*), Kauai population
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Kauai Forest Birds Recovery Plan (a second population on Maui is addressed in the Maui/Molokai Forest Bird Recovery Plan)
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/August 13, 1984
9. Recovery Objective/Criteria: Kauai population (*H. l. hanapepe*): Downlist to threatened when the population increases to 1,000 birds.
10. Major Activity Since Last Report: Kauai population: A forest bird survey was completed in 1989 on Kauai, but no nukupuu were recorded.
11. Major Activity Over Next Reporting Period: Management of habitat will continue. It may not be possible to recover this species, which is found at critically low numbers and may be near extinction.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

93 Nukupu'u, Maui population

1. Species: Nukupu'u (honeycreeper) (*Hemignathus lucidus*), Maui population
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Maui-Molokai Forest Birds Recovery Plan (the Kauai population is addressed in the Kauai Forest Bird Recovery Plan)
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 13, 1985
9. Recovery Objective/Criteria: Maui population (*H. l. affinus*): To restore viable populations to non-endangered status within essential habitat areas defined in the recovery plan.
10. Major Activity Since Last Report: Maui population: Fencing and control of feral ungulates began at the Hanawi Natural Area Reserve (State). The National Park Service continues feral animal control and exotic vegetation control at Haleakala National Park, as does TNC at Waikamoi Preserve.
11. Major Activity Over Next Reporting Period: Management of habitat will continue. It may not be possible to recover this species, which is found at critically low numbers and may be near extinction.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

94 Kauai 'o'o

1. Species: Kauai 'o'o (='O'o'A'a) (*Moho braccatus*)
2. Listing/Date: Endangered/March 11, 1967.
3. Group: Birds
4. Species Status: Declining (possibly extinct)
5. Recovery Priority: 5
6. Recovery Plan Title: Kauai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/August 13, 1984
9. Recovery Objective/Criteria: Downlist to threatened when the population reaches 1,000 individuals.
10. Major Activity Since Last Report: A forest bird survey was conducted in 1989, but no Kauai 'o'o were recorded. The species may be extinct.
11. Major Activity Over Next Reporting Period: Protection of primary habitat on Kauai will continue.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Hawaiian ‘o‘u, Hawaii population 95

1. Species: Hawaiian ‘o‘u (honeycreeper) (*Psittirostra psittacea*), Hawaii population
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining (may be extinct on the Big Island)
5. Recovery Priority: 4
6. Recovery Plan Title: Hawaii Forest Birds Recovery Plan (Kauai population addressed in the Kauai Forest Bird Recovery Plan)
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/February 3, 1983
9. Recovery Objective/Criteria: To assure that viable populations are maintained and that the species is ultimately restored to a delisted status. Further research is required to determine when the ‘o‘u can be reclassified to threatened or be delisted.
10. Major Activity Since Last Report: On Hawaii: There have been no sightings of this species since the last report, and it may be extinct. Progress at the newly established Hakalau Forest National Wildlife Refuge includes fencing, feral animal control, exotic vegetation control, and forest bird surveys and studies. Negotiations to secure additional lands continue. "Limiting factors" studies by the U.S. Fish and Wildlife Service (Research) continue.
11. Major Activity Over Next Reporting Period: Securing and managing habitat remains a priority. Surveys and limiting factors research will continue.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Hawaiian ‘o‘u, Kauai population 95

1. Species: Hawaiian ‘o‘u (honeycreeper) (*Psittirostra psittacea*), Kauai population
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining (may be near extinction)
5. Recovery Priority: 4
6. Recovery Plan Title: Kauai Forest Bird Recovery Plan (Hawaii population addressed in the Hawaii Forest Bird Recovery Plan)
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/July 29, 1983
9. Recovery Objective/Criteria: On Kauai: to downlist to threatened when the population increases to 1,000 birds.
10. Major Activity Since Last Report: "Limiting factors" studies by the U.S. Fish and Wildlife Service (Research) continue on Hawaii. On Kauai, three birds were recorded during a survey conducted in 1989.
11. Major Activity Over Next Reporting Period: Surrogate work in the captive propagation of forest birds will begin. These techniques may eventually be needed to propagate the o'u. Managing habitat remains a priority. Surveys and limiting factors research will continue.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

96 Northern spotted owl

1. Species: Northern spotted owl (*Strix occidentalis caurina*)
2. Listing/Date: Threatened/June 26, 1990
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 9C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Plans are being made to appoint a recovery team to prepare a recovery plan. Coordination of this effort will be through the Regional Office. In addition, the Service is considering whether to designate critical habitat for the subspecies.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Northern spotted owls primarily inhabit mature and old growth coniferous forests of the Pacific Northwest.

97 Palila

1. Species: Palila (honeycreeper) (*Loxioides bailleui*)
2. Listing/Date: Endangered/March 11, 1967.
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 7
6. Recovery Plan Title: Palila Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/June 27, 1986
9. Recovery Objective/Criteria: To downlist to threatened: a minimum population of 3,500 birds must be reached for 5 consecutive years throughout the 140 sq. km of the present range. For complete delisting: a minimum population of 5,000 birds must be maintained for 5 consecutive years throughout the 200 sq km of critical habitat.
10. Major Activity Since Last Report: Native Mamane forest continues to regenerate rapidly after the removal of most feral sheep in critical habitat. The U.S. Fish and Wildlife Service Hawaii Research Station continues studies on nesting and "limiting factors." A student from the University of Hawaii has initiated a study on the effect of introduced mammalian predators on palila.
11. Major Activity Over Next Reporting Period: Current studies will continue. Feral sheep will be removed if numbers increase significantly.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

Puerto Rican parrot

98

1. Species: Puerto Rican parrot (*Amazona vittata*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for the Puerto Rican parrot, *Amazona vittata*
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/ November 30, 1982; April 8 1987.
9. Recovery Objective/Criteria: Recovery of the Puerto Rican parrot will require at least 2 separate, secure, wild, and self-sustaining populations with a minimum effective population size of 500 birds each.
10. Major Activity Since Last Report: Continuation and improvement of captive breeding portion of the recovery program; continuation of management of wild flock; completion of construction of second aviary and transfer of Hispaniolan parrots to the Rio Abajo Forest; preparation of Population Viability Analysis report and Captive Master Plan; transfer of management activities from Region 8 to Region 4; possible loss of 50% of wild population as a result of Hurricane Hugo.
11. Major Activity Over Next Reporting Period: Continuation of captive breeding and wild flock management; transfer of parrots to Rio Abajo aviary; research to be carried out by Region 8.
12. Recovery Achieved: 1
13. Information Current as of: July 7, 1990

The declines in the wild Puerto Rican parrot population after Hurricane Hugo in 1989 placed increased importance on the captive bred birds at the Fish and Wildlife Service's Luquillo Aviary. Captive-bred parrots will be released into the wild in the future to occupy suitable habitat.

Maui parrotbill

99

1. Species: Maui parrotbill (honeycreeper) (*Pseudonestor xanthophrys*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 4
6. Recovery Plan Title: Maui/Molokai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 13, 1985
9. Recovery Objective/Criteria: To restore viable populations to nonendangered status within essential habitat areas defined in the recovery plan. The key goals focus on the stabilization and restoration of essential habitat.
10. Major Activity Since Last Report: Fencing and control of feral ungulates began at the Hanawi Natural Area Reserve (State). The National Park Service continues feral animal control and exotic vegetation control at Haleakala National Park, as does the Nature Conservancy at Waikamoi Preserve.
11. Major Activity Over Next Reporting Period: Management of habitat will continue. It may not be possible to recover this species without research to determine the biological factors limiting the population. Such research is identified as a recovery action item, but there are no imminent plans to conduct this research on Maui. Limiting factors research is being conducted on the Big Island of Hawaii that may be applicable to this species on Maui.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

100 Brown pelican

1. Species: Brown pelican (*Pelecanus occidentalis californicus*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: The California Brown Pelican Recovery Plan.
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/February 3, 1983
9. Recovery Objective/Criteria: To restore and maintain stable, self-sustaining populations throughout its range by 1) maintaining existing populations in Mexico; 2) ensuring long-term protection of food supplies and essential nesting, roosting, and offshore habitat throughout the range; and 3) restoring population size and productivity to a self-sustaining level in the Southern California Bight.
10. Major Activity Since Last Report: Monitoring breeding populations and recruitment success.
11. Major Activity Over Next Reporting Period: Monitoring food base and response of breeding population to the availability of prey species.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

101 Brown pelican

1. Species: Brown pelican (*Pelecanus occidentalis carolensis*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan For The Eastern Brown Pelican
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/July 19, 1990
9. Recovery Objective/Criteria: Stabilize/Restore the species in vacant nesting habitat. Maintain natural and restocked colonies through natural reproduction, including the development of a long range monitoring plan.
10. Major Activity Since Last Report: Nesting occurred on only three sites this year (Pelican Island, Sundown Island, and Dressing Point). No nesting on Cedar Lakes, Second Chain of Islands, or Steamboat Island. Data on number of nest per colony and success is not yet available.
11. Major Activity Over Next Reporting Period: Texas Parks and Wildlife Department and Brazoria National Wildlife Refuge will continue to monitor nesting success during annual Colonial Waterbird Surveys. Brazoria National Wildlife Refuge will continue to stabilize the erosion occurring on Dressi Point.
12. Recovery Achieved: 3
13. Information Current as of: July 30, 1990

Hawaiian dark-rumped petrel 102

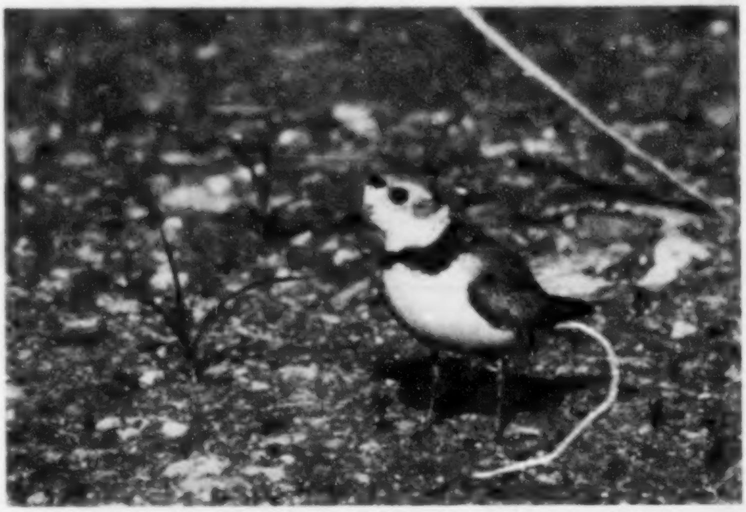
1. Species: Hawaiian dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 7, 1983
9. Recovery Objective/Criteria: To downlist to theatened by reducing annual fallout, protecting nesting colonies, and developing efficient predator control programs. Exact numbers to be maintained have not yet been determined.
10. Major Activity Since Last Report: Maintenance and operation of "fallout" stations on Kauai has continued. Resource agencies continue to pursue the licensing of diphasinone for predator control. Predator control and annual surveys have continued around a main nesting colony at Haleakala National Park.
11. Major Activity Over Next Reporting Period: Current activities will be continued.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

Puerto Rican plain pigeon 103

1. Species: Puerto Rican plain pigeon (*Columba inornata wetmorei*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9C
6. Recovery Plan Title: Puerto Rican Plain Pigeon Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 14, 1982
9. Recovery Objective/Criteria: Delist/none specified
10. Major Activity Since Last Report: Conducting field research on habitat, captive breeding program at Humacao Aviary, periodical censuses at Cidra.
11. Major Activity Over Next Reporting Period: Continue the captive breeding program at Humacao aviary.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

104 Piping plover, Atlantic Coast population

1. Species: Piping plover (*Charadrius melodus*), Atlantic Coast population
2. Listing/Date: Threatened/December 11, 1985
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 2C
6. Recovery Plan Title: Atlantic Coast Piping Plover Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/March 31, 1988
9. Recovery Objective/Criteria: Delist/Increase population (U.S. and Canada) to 1,200 pairs, while maintaining current distribution pattern.
10. Major Activity Since Last Report: Preparation of listing package for critical habitat designation. Habitat protection and population monitoring. Information and education activities.
11. Major Activity Over Next Reporting Period: Coordination with landowners in conjunction with critical habitat designation. Continued protection of nesting, foraging, and wintering sites.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990



Piping plovers are threatened by human disturbance of their nesting habitat along beaches and sandbars.

Piping plover, Interior population

1. Species: Piping plover (*Charadrius melodus*), Interior population
2. Listing/Date: Endangered/Great Lakes watershed, threatened elsewhere/December 11, 1985
3. Group: Birds
4. Species Status: Declining in Great lakes, possibly declining in Great Plains
5. Recovery Priority: 2C
6. Recovery Plan Title: Great Lakes & Northern Great Plains
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/Great Lakes & Northern Great Plains May 12, 1988
9. Recovery Objective/Criteria:

   Delist Northern Great Plains Population. Increase birds to 1,300 pairs, and maintain that level for 15 years as follows:

   Montana—60 pairs

   North Dakota—650 pairs (Missouri River 100 pairs, Missouri coteau 550 pairs).

   South Dakota—350 pairs (includes 250 pairs shared with Nebraska on Missouri River): Missouri River—below Gavin's Point 250 pairs, other Missouri River sites 75 pairs; other sites 25 pairs.

   Nebraska—465 pairs (includes 250 pairs shared with South Dakota on the Missouri River), Platte River 140 pairs, Niobrara River 50 pairs, Missouri River 250 pairs, Loup River system 25 pairs.

   Minnesota—25 pairs

   Stabilize Great Lakes Population. Increase to 150 pairs and maintain that level for 15 years distributed as follows:

   Duluth/Superior—5 pairs, Wisconsin 15 pairs (includes Duluth/Superior),

   Michigan—100 pairs, other Great lakes sites 35 pairs
10. Major Activity Since Last Report: Status surveys have been completed. The Great Lakes & Northern Great Plains Recovery team finalizes plans to coordinate a 1991 International Census. Canadian Wildlife Service Representative spent several weeks during the winter of 1990 in Cuba searching for birds; only a very few were observed, but the amount of area to canvas is immense.
11. Major Activity Over Next Reporting Period: International Census will be conducted, which will provide the latest population figures for the Atlantic Coast and interior populations. We need to stress continued cooperation with Canada and Mexico.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

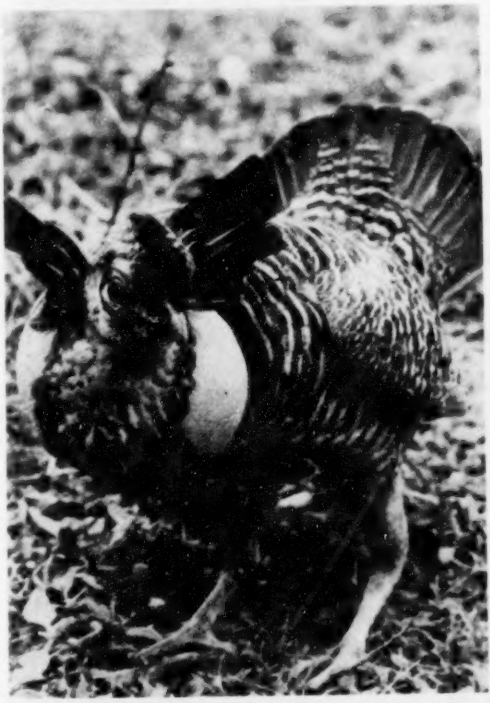
106 Po‘ouli

1. Species: Po‘ouli (honeycreeper) (*Melamprosops phaeosoma*)
2. Listing/Date: Endangered/September 25, 1975
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 4
6. Recovery Plan Title: Maui/Molokai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 13, 1985
9. Recovery Objective/Criteria: To restore viable populations to non-endangered status within essential habitat areas defined in the recovery plan. The key goals focus on the stabilization and restoration of essential habitat.
10. Major Activity Since Last Report: Fencing and control of feral ungulates began at the Hanawi Natural Area Reserve (State), the heart of known Po'o-uli habitat. The National Park Service continues feral animal control and exotic vegetation control at Haleakala National Park, as does The Nature Conservancy at Waikamoi Preserve.
11. Major Activity Over Next Reporting Period: Management of habitat will continue. It may not be possible to recover this species, which is found at critically low numbers, without research to determine the biological factors limiting the population. Such research is identified as a recovery action item, but there are no imminent plans to conduct this research on Maui. Limiting factors research is being conducted on the Big Island of Hawaii that may be applicable to this species on Maui.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Attwater's greater prairie-chicken

107

1. Species: Attwater's greater prairie-chicken (*Tympanuchus cupido attwateri*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Attwater's Prairie Chicken Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/December 16, 1983



Currently restricted to Texas and dependent upon native prairies, Attwater's greater prairie chicken is threatened by agricultural and suburban development. In 1972, the Fish and Wildlife Service established Attwater Prairie Chicken National Wildlife Refuge to maintain some protected habitat for the species.

9. Recovery Objective/Criteria: Downlist and Delist. Downlist to Threatened when population at 3,000 wild birds. Delist when population at 5,000 wild birds with 25,000 acres managed for the bird.
10. Major Activity Since Last Report: Section 6 Activities: One habitat management agreement signed in Victoria County, one more imminent in Austin County, and two additional being discussed in Victoria county. Joint Texas/ Louisiana project being developed. First annual symposium to discuss and promote Attwater's Prairie Chickens (APCs) sponsored in Victoria in February 1990. Quarterly status report being generated to stimulate public interest and concern. Attwater Prairie-chicken Recovery Fund established with the National Fish and Wildlife Foundation by initial $5,000 donation by CONOCO, Inc. Matching funds from the foundation are pending. Continuing site evaluation process to bring private landowners into the program for management of APCs. Refencing of refuge to manage grazing by soil types has been implemented. Acquired a tractor and ditcher to enhance drainage on Attwater's Prairie-chicken National Wildlife Refuge (APC-NWR).
11. Major Activity Over Next Reporting Period: Continue private land management agreements under Section 6 program. Initiate captive breeding research at Fossil Rim Wildlife Center, Glen Rose, Texas. Pursue translocation research at Texas A&M University. Continue quarterly status report publication. Sponsor a second annual APC Symposium. Develop an attractive brochure, for private landowners, outlining native prairie management by grazing for wildlife. Expand the spring survey by volunteers on the ground. Begin imported fire ant research on the refuge to determine impacts on nesting APCs. Add a biologist/range specialist to the APCNWR staff to work with management and recovery of the APC. Pursue acquisition of Carson/Edwards refuge in Victoria County.
12. Recovery Achieved: 1
13. Information Current as of: July 24, 1990

108 California clapper rail

1. Species: California clapper rail (*Rallus longirostris obsoletus*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Salt Marsh Harvest Mouse/California Clapper Rail Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/November 16, 1984
9. Recovery Objective/Criteria: Downlist when 3,900 hectares of public-owned habitat secured, 3200 hectares of privately owned habitat secured, and an additional 7,000 hectares of largely unsuitable habitat restored and secured.
10. Major Activity Since Last Report: Rangewide population census.
11. Major Activity Over Next Reporting Period: Partial rangewide population census.
12. Recovery Achieved: 1
13. Information Current as of: July 17, 1990

109 Guam rail

1. Species: Guam rail (*Rallus owstoni*)
2. Listing/Date: Endangered/August 27, 1984
3. Group: Birds
4. Species Status: Stable (all animals are in captivity)
5. Recovery Priority: 2
6. Recovery Plan Title: Guam Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Control and/or eradicate the brown tree snake on Guam. Establish captive population for transplanting and reestablishment project. Reestablish a population of 3,000 birds on Guam; 1,000 in Northern Guam; 2,000 in Southern Guam.
10. Major Activity Since Last Report: There are no rails left in the wild. The establishment of an experimental artificial population on the Island of Rota is underway. Thirteen of 22 rails released are known to be dead; the status of the remaining 9 rails is unknown, but they, too, may have died.
11. Major Activity Over Next Reporting Period: Continuation of captive propagation and establishment of experimental artificial population on Rota. A large release of between 50 and 100 rails will be made next year.
12. Recovery Achieved: 1
13. Information Current as of: September, 1990

Light-footed clapper rail 110

1. Species: Light-footed clapper rail (*Rallus longirostris levipes*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Light-footed Clapper Rail Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/June 1985
9. Recovery Objective/Criteria: Species could be considered for reclassification (to threatened status) if the breeding population reaches 800 pairs and 2,000 hectares of suitably managed, appropriate salt marsh habitat is present in 4,000 or more wetland acres in at least 20 marsh complexes.
10. Major Activity Since Last Report: Censuses throughout the U.S. range of the species continued; it is now more apparent than ever that the species is critically endangered. Only the Upper Newport Bay population in Orange County is currently reasonably safe from extirpation; all others are declining and/or unacceptably small. Management efforts have been studied and effectively implemented in at least one locale. The construction (and use) of artificial nesting platforms continued at several locales; contaminants studies continued.
11. Major Activity Over Next Reporting Period: Attempts to identify and manage known rail predators will continue at Upper Newport Bay and Seal Beach National Wildlife Refuge; efforts at the latter apparently have generated a much-needed population increase at that locale. Hopefully, funds will remain available to expand much-needed management efforts and studies. Contaminants testing will include testing of abandoned eggs; baselines will be established.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Yuma clapper rail 111

1. Species: Yuma clapper rail (*Rallus longirostris yumanensis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 6
6. Recovery Plan Title: Yuma Clapper Rail Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/February 4, 1983
9. Recovery Objective/Criteria: Downlist. Stabilize population at 700- 1,000 individuals, survey annually, and protect habitat.
10. Major Activity Since Last Report: Multi-agency annual breeding survey was conducted during May and June, 1990, for entire Colorado River downstream of Davis Dam and for selected interior locations within Arizona.
11. Major Activity Over Next Reporting Period: Annual survey will be continued and opportunities to improve management of habitat will be pursued.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

112

Newell's Townsend's shearwater

1. Species: Newell's Townsend's shearwater (*Puffinus auricularis newelli*)
2. Listing/Date: Threatened/September 25, 1975
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 7, 1983
9. Recovery Objective/Criteria: To downlist to theatened by reducing annual fallout, protecting nesting colonies, and developing efficient predator control programs. Exact numbers to be maintained have not yet been determined.
10. Major Activity Since Last Report: Maintenance and operation of "fallout" stations on Kauai has continued. Resource agencies continue to pursue the licensing of diphasinone for predator control. No shearwaters have been reported to nest in the transplanted colony at Kilauea Point, although birds have returned annually.
11. Major Activity Over Next Reporting Period: Current activities will be continued.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

113

San Clemente loggerhead shrike

1. Species: San Clemente loggerhead shrike (*Lanius ludovicianus mearnsi*)
2. Listing/Date: Endangered/August 11, 1977
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: California Channel Islands Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Eliminate threat from introduced goats, pigs, and cats.
10. Major Activity Since Last Report: Intensive efforts to eradicate feral goats, pigs, and cats continue.
11. Major Activity Over Next Reporting Period: Continued removal of feral animals.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Cape Sable seaside sparrow 114

1. Species: Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 12C
6. Recovery Plan Title: Cape Sable Seaside Sparrow Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 6, 1983
9. Recovery Objective/Criteria: Downlisting/The species can be considered for downlisting when the following criteria are met: The reasons for the past fluctuations and/or declines in population are accurately determined. Management techniques are employed which will insure the long-term protection and maintenance of the sparrow's functional ecosystem throughout the species' historical range. The population maintains a minimum of 6,600 birds; all fluctuations should be above this level.
10. Major Activity Since Last Report: No recent surveys or activities. Continued prescribed burns on Park Service lands.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Dusky seaside sparrow 115

1. Species: Dusky seaside sparrow (*Ammodramus maritimus nigrescens*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Extinct
5. Recovery Priority: 6
6. Recovery Plan Title: Dusky Seaside Sparrow Recovery Plan.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 26, 1979.
9. Recovery Objective/Criteria: Restore the species to a point that it is no longer threatened with extinction.
10. Major Activity Since Last Report: Proposal to delist species published 4/26/90 based on spring 1989 field surveys.
11. Major Activity Over Next Reporting Period: None
12. Recovery Achieved: 1
13. Information Current as of: July 1990

116 Florida grasshopper sparrow

1. Species: Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)
2. Listing/Date: Endangered/July 31, 1986
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Florida Grasshopper Sparrow Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/May 19, 1988
9. Recovery Objective/Criteria: Downlist/When populations of 100 to 200 adult birds become established at each of 10 secure, discrete sites dispersed throughout the former range of the subspecies. Delist/When populations of 100 to 200 adults birds become established at each of 25 secure, discrete sites dispersed throughout the former range of the subspecies.
10. Major Activity Since Last Report: Distribution survey done by Florida Game Commission throughout historic range.
11. Major Activity Over Next Reporting Period: Continuation of distribution surveys until 1992.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

117 San Clemente sage sparrow

1. Species: San Clemente sage sparrow (*Amphispiza belli clementeae*)
2. Listing/Date: Threatened/August 11, 1977
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: California Channel Islands Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Eliminate threat from introduced goats, pigs, and cats.
10. Major Activity Since Last Report: Intensive efforts to eradicate feral goats, pigs, and cats continue.
11. Major Activity Over Next Reporting Period: Continued removal of feral animals.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Hawaiian stilt

118

1. Species: Hawaiian stilt (= Ae'o) (*Himantopus himantopus knudseni*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Hawaiian Waterbirds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/September 11, 1985
9. Recovery Objective/Criteria: To delist by maintaining a population of at least 2,000, as distributed in 1976, in the habitat types.
10. Major Activity Since Last Report: A full-time realty position has been established and filled in Honolulu. Negotiations continue to secure wetland habitat around James Campbell National Wildlife Refuge (NWR) on Oahu and at Kealia on Maui. Resource agencies continue to pursue the licensing of diphasinone for predator control. Ownership of Kawainui Marsh on Oahu was transferred from the City and County of Honolulu to the State for management by the Division of Land and Natural Resources. The creation of wetland habitat at Mana on Kauai continues. Biannual waterbird surveys continue.
11. Major Activity Over Next Reporting Period: Surveys will continue. Additions to James Campbell NWR should be finalized. Kealia should be under the National Wildlife Refuge System. Management of Kawainui for waterbirds will begin.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

Wood stork

119

1. Species: Wood stork (*Mycteria americana*) Southeast U.S. population
2. Listing/Date: Endangered/February 28, 1984
3. Group: Birds
4. Species Status: Stable.
5. Recovery Priority: 6C
6. Recovery Plan Title: Wood Stork Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 9, 1986
9. Recovery Objective/Criteria: Downlist/When population reaches and maintains 6,000 breeding pairs. Delist/When population reaches and maintains 10,000 breeding pairs. Population should be distributed throughout the historic range.
10. Major Activity Since Last Report: Regional colony surveys. Savannah River Plant study to determine success of mitigation ponds.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

120 Mariana gray swiftlet

1. Species: Mariana gray swiftlet (= Vanikoro) (*Aerodramus vanikorensis bartschi*)
2. Listing/Date: Endangered/August 27, 1984
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for the Mariana Islands Population of the Vanikoro Swiftlet
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A/1988—Not Approved yet
9. Recovery Objective/Criteria: Downlist to threatened status when populations of 2,000 birds can be maintained on Guam, 2,000 on Rota, 1,000 on Aguijan, and 2,000 on Saipan.
10. Major Activity Since Last Report: A Division of Fish and Wildlife biologist on Saipan has had encouraging results in nesting success by controlling cockroaches in swiftlet caves. The roaches apparently consume the substance attaching the nests to the cave wall, causing them to fall to the floor of the cave, destroying eggs and endangering young.
11. Major Activity Over Next Reporting Period: none
12. Recovery Achieved: 1
13. Information Current as of: August 1990

121 California least tern

1. Species: California least tern (*Sterna antillarum browni*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Declining recently stable at 1200+/– pairs
5. Recovery Priority: 6C
6. Recovery Plan Title: California Least Tern Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/Rev/May 1980
9. Recovery Objective/Criteria: Before downlisting to threatened can be considered, 1,200 pairs must be present in a total of 20 secure wetland ecosystems. Each of these wetlands must have a minimum of 20 breeding pairs with a 5-year mean reproductive rate of at least 1.0 fledged young per breeding pair. Of the 20 secure wetlands, San Francisco Bay, Mission Bay, and San Diego Bay must have at least 4, 6, and 6 colonies respectively.
10. Major Activity Since Last Report: Colony monitoring and management continue at most of the largest nesting sites. However, several historic sites evidently were not used by terns (i.e. not occupied) during the 1990 breeding season (e.g. 3 of 7 colonies in San Diego Bay). Moreover, colony or nest abandonments continued at various sites throughout the range of the species.
11. Major Activity Over Next Reporting Period: Colony monitoring and predator management will continue at Navy-administered sites for at least one more year; several other management programs are ongoing. Hopefully, money will become available to protect and monitor some of the smaller colonies and insure active predator management throughout the range of the species.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Least tern 122

1. Species: Least tern (*Sterna antillarum*), Interior population
2. Listing/Date: Endangered/May 28, 1985
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 3C
6. Recovery Plan Title: Recovery Plan for the Interior Population of the Least Tern
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/September 19, 1990
9. Recovery Objective/Criteria: Delisting can be considered when the interior population has increased from the present 5,000 to 7,000 and remains stable for 10 years and 4 major censuses have been completed. Recovery population numbers are as follows:

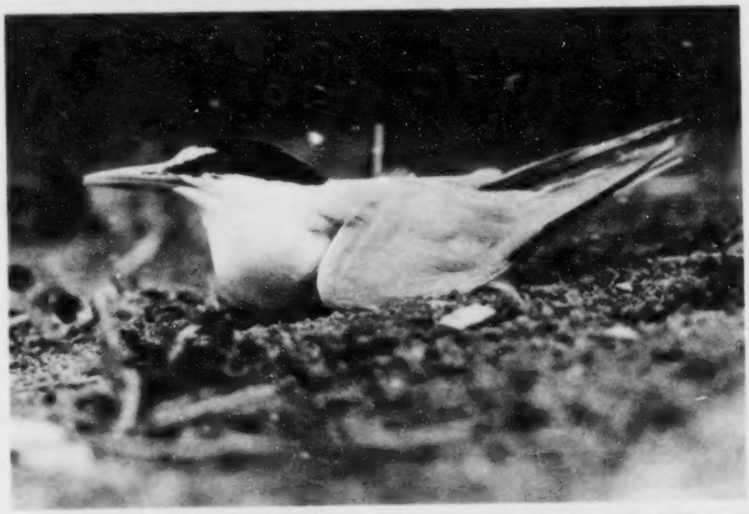
   Missouri River system will increase to 2,100 birds—Montana 50, North Dakota 250, South Dakota 680 (includes 400 shared with Nebraska on the Missouri River), Nebraska 1520,

   Mississippi and Ohio River system will remain stable at current population of 2,200-2,500 birds, Arkansas River system will increase to 1,600 birds,

   Red River system will increase to 300 birds,

   Rio Grande River system will remain stable at 500 birds.

10. Major Activity Since Last Report: Increased emphasis on habitat protection and reduction of public disturbance. Research continues along the lower Mississippi to identify breeding habitat, monitor population density, and determine breeding success.
11. Major Activity Over Next Reporting Period: Continue to monitor existing populations, identify new habitat, increase understanding of the species' biology.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990



Least terns are colonial birds which nest mainly on bare alluvial islands or sandbars. Due to channelization and damming of rivers, much of the species' habitat has been destroyed.

123 Roseate tern

1. Species: Roseate tern (*Sterna dougallii dougallii*)
2. Listing/Date: Endangered Northeast U.S., threatened, Florida southward/November 2, 1987
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Roseate Tern Recovery Plan — Northeastern Population
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/March 20, 1989
9. Recovery Objective/Criteria: Delist/Increase nesting population to 5,000 pairs, including 6 productive colonies with more than 200 pairs, sustained for 5 years.
10. Major Activity Since Last Report: Population dynamics study on nesting colonies. Gull removal on one of two colony restoration sites initiated. Population is stable with 3,188 pairs at 18 sites in 1989 (but 84% of the pairs are at 2 sites).
11. Major Activity Over Next Reporting Period: The population dynamics study will wind down and a wintering ground study will be initiated, contingent on available funding. Gull removal on both colony restoration sites will proceed.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

124 Large Kauai thrush

1. Species: Large Kauai thrush (kamao) (*Myadestes myadestina*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Kauai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/August 13, 1984
9. Recovery Objective/Criteria: Downlist to threatened when the population reaches 1,000 individuals.
10. Major Activity Since Last Report: A forest bird survey was conducted in 1989, but only 3 kamao were recorded. The species may be very near extinction.
11. Major Activity Over Next Reporting Period: Protection of primary habitat on Kauai will continue. The cause of the decline is not known, and little can be done to actively manage this population without a better understanding of the species decline. Limiting factors research being conducted on the big Island of Hawaii may be applicable to this species on Kauai.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Molokai thrush

125

1. Species: Molokai thrush (= oloma'o) (*Myadestes lanaiensis rutha*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Maui/Molokai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 13, 1985
9. Recovery Objective/Criteria: To restore viable populations to non-endangered status within essential habitat areas defined in the recovery plan. The key goals focus on the stabilization and restoration of essential habitat.
10. Major Activity Since Last Report: Fencing and control of feral ungulates began at the State Natural Area Reserve on the Waikolu Plateau. The National Park Service continued to work on establishment of a National Park at Kalaupapa. The Nature Conservancy (TNC) has established and is beginning to manage two large reserves, Pelekunu Valley and Kamako. Preliminary results of a forest bird survey conducted in 1988 are completed.
11. Major Activity Over Next Reporting Period: Management of habitat will continue. Only one thrush was recorded during the 1988 Molokai survey, and this species may be very near extinction.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Small Kauai thrush

126

1. Species: Small Kauai thrush (= puaiohi) (*Myadestes palmeri*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Kauai Forest Birds Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/August 13, 1984
9. Recovery Objective/Criteria: Downlist to threatened when the population reaches 1,000 individuals.
10. Major Activity Since Last Report: A forest bird survey was conducted in 1989; 14 birds were recorded during the survey. The population appears to be stable, but survives only at critically low numbers.
11. Major Activity Over Next Reporting Period: Protection of primary habitat on Kauai will continue. The cause of depressed numbers is not known, and little can be done to actively manage this population without a better understanding of the species decline. Limiting factors research being conducted on the big Island of Hawaii may be applicable to this species on Kauai.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

127 Inyo brown towhee

1. Species: Inyo brown towhee (*Pipilo fuscus eremophilus*)
2. Listing/Date: Threatened/August 3, 1987
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: The Bureau of Land Management established an Area of Critical Environmental Concern at least in part to protect towhee habitat. A 3-year life history study/habitat inventory was completed, through U.S. Navy funding.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

128 Black-capped vireo

1. Species: Black-capped vireo (*Vireo atricapillus*)
2. Listing/Date: Endangered/October 6, 1987
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Various research studies, monitoring, and cowbird trapping have continued. Progress continued on a Habitat Conservation Plan (Balcones Canyonlands HCP) that will include this species.
11. Major Activity Over Next Reporting Period: HCP may be completed, approved, and implementation (including land acquisition) begun. Finalize recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

Least bell's vireo 129

1. Species: Least bell's vireo (*Vireo bellii pusillus*)
2. Listing/Date: Endangered/May 2, 1986
3. Group: Birds
4. Species Status: Improving
5. Recovery Priority: 3C
6. Recovery Plan Title: Least Bell's Vireo Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A
9. Recovery Objective/Criteria: Reverse trend of loss and degradation of habitat; control nest parasitism through habitat protection, restoration, and management.
10. Major Activity Since Last Report: Negotiated management and habitat restoration in the Prado Basin. Examined feasibility of listing critical habitat. Critical habitat proposal being finalized.
11. Major Activity Over Next Reporting Period: Finalize critical habitat designation.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Nightingale reed warbler 130

1. Species: Nightingale reed warbler (willow) (*Acrocephalus luscinia*)
2. Listing/Date: Endangered/June 2, 1970; December 2, 1970
3. Group: Birds
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: none
11. Major Activity Over Next Reporting Period: Biologists with the Commonwealth of the Northern Mariana Islands' Division of Fish Wildlife intend to determine the relative value of monotypic tangan-tangan (*Leucaena latisiliqua*) forests in providing habitat for the warbler as compared to more diverse plant species mixes.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

131 Bachman's warbler

1. Species: Bachman's warbler (*Vermivora bachmanii*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Birds
4. Species Status: Unknown (Species known only from a few sightings in the last decade in Cuba)
5. Recovery Priority: 5
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: NA
10. Major Activity Since Last Report: The Asheville, North Carolina, Field Office is cooperating with the U.S. Forest Service on the Francis Marion National Forest in South Carolina to monitor for nesting birds returning to the last known nesting habitat. Experimental cuts to duplicate preferred nesting habitat were made and were being monitored when Hurricane Hugo destroyed most of the large timber on the Francis Marion in the fall of 1989. It is unknown what effects the hurricane may have had on this species, but it is hypothesized that more favorable nesting habitat may be available as a result. Monitoring is continuing. A search of the Tensas National Wildlife Refuge was carried out to document the presence of this species in the Tensas River basin in northeast Louisiana. The search was unsuccessful.
11. Major Activity Over Next Reporting Period: Monitoring (See #10)
12. Recovery Achieved: 1
13. Information Current as of: June 1990

132 Golden-cheeked (wood) warbler

1. Species: Golden-cheeked (wood) warbler (*Dendroica chrysoparia*)
2. Listing/Date: Endangered/May 4, 1990
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Emergency listed. The warbler is one of the species being addressed in the development of a Habitat Conservation Plan (HCP) in the Austin, Texas area.
11. Major Activity Over Next Reporting Period: Complete final rule by the time the emergency rule expires. Complete draft recovery plan. Complete HCP as soon as possible and begin land acquisition.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Golden-cheeked warblers require large areas of mature Ashe juniper and oak woodlands for nesting and foraging. These areas are disappearing due to juniper eradication programs and urbanization.

Kirtland's warbler

133

Species: Kirtland's warbler (*Dendroica kirtlandii*)

Listing/Date: Endangered March 11, 1967

Group: Birds

Species Status: Improving

Recovery Priority: 5C

Recovery Plan Title: Kirtland's Warbler Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 3

Recovery Plan Stage/Date: Rev/September 30, 1985

Recovery Objective/Criteria: Delisting. A self-sustaining population of at least 1,000 pairs.

10. Major Activity Since Last Report: The 1990 Michigan Kirtland's warbler count totalled 265 singing males, a 25% increase over the 1989 count, and the highest population since the population crash in the 1960's. Only one male was located in Wisconsin. Over 5,900 acres have been acquired by the Service in Michigan for inclusion in Kirtland's warbler habitat management units over the last 6 years. Cowbird control has continued with over 7,500 cowbirds removed from warbler breeding colonies in 1990. The Patuxent Wildlife Research Center project continues to study site fidelity, colony establishment, mortality, and habitat preferences. An Ohio Cooperative Research Unit study began looking at habitat variables and their effects on mating systems and the production of offspring. 1,500 acres of habitat were created by Michigan DNR and U.S. Forest Service in 1990. The Forest Service is using hand-planting to augment the tree densities resulting from the normal machine-planting method. A Biological Opinion was completed for planned development of additional military training facilities at Camp Grayling. The opinion found no jeopardy to the warbler, and specified several measures to minimize incidental take.
11. Major Activity Over Next Reporting Period: Continuation of all above activities.
12. Recovery Achieved: 2
13. Information Current as of: July 23, 1990

Bridled white-eye

134

Species: Bridled white-eye (*Zosterops conspicillatus conspicillatus*)

Listing/Date: Endangered/August 27, 1984

Group: Birds

Species Status: Extinct

Recovery Priority: 6

Recovery Plan Title: Guam Forest Birds Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: F/September 28, 1990

9. Recovery Objective/Criteria: Control and/or eradicate the brown tree snake on Guam; establish captive populations for transplant and reestablishment projects. Note: This species is believed to be extinct.
10. Major Activity Since Last Report: Drafted proposal for critical habitat designation.
11. Major Activity Over Next Reporting Period: Propose critical habitat designation on Guam.
12. Recovery Achieved: 1
13. Information Current as of: September, 1990

135 Ivory-billed woodpecker

1. Species: Ivory-billed woodpecker (*Campephilus principalis*) (*C. p. principalis*) is the American ivory-billed woodpecker which historically occurred in the southeastern U.S. Another subspecies survives in Cuba.
2. Listing/Date: Endangered/March 11, 1967; June 2, 1970
3. Group: Birds
4. Species Status: Extinct (presumed)
5. Recovery Priority: 18
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: NA
10. Major Activity Since Last Report: Ten thousand brochures describing the bird were distributed to foresters, birders, biologists, and others frequenting the last potential habitats in the southeastern U.S. Dr. Jerome Jackson voluntarily continued to search likely areas. News articles and the brochures encouraged sighting reports be sent to Dr. Jackson who is compiling such reports.
11. Major Activity Over Next Reporting Period: The Service will monitor sighting reports and Dr. Jackson's efforts for another year before evaluating whether the species should be declared extinct in the United States.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

136 Red-cockaded woodpecker

1. Species: Red-cockaded woodpecker (*Picoides borealis*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Birds
4. Species Status: Declining
5. Recovery Priority: 8C
6. Recovery Plan Title: Red-Cockaded Woodpecker Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/August 24, 1979; April 11, 1985.
9. Recovery Objective/Criteria: Downlist and then delist the species. Requirement for downlisting is six viable populations within the major physiographic regions of its range. Requirement for delisting is 15 viable populations within the major geographic areas of its range. Tasks to meet these goals include: Surveying, monitoring, and assessing status of populations and species; protecting and managing habitat; research on habitat and management needs, population dynamics and genetic variation; and involving the public in the recovery effort.
10. Major Activity Since Last Report: Past failure to provide habitat management is being remedied with increased funds and manpower. Completed several consultations on Federal land management that have prescribed needed changes. Research has provided new information on genetic variation, population viability, transplanting techniques, rehabilitation of cavity trees with restrictors and colony sites with hardwood removal, and use of artificial cavities. Many of the management techniques developed through this research are being implemented by land managers. A publication on the species and private landowners was published.
11. Major Activity Over Next Reporting Period: Increased implementation of habitat management, cavity tree and colony site rehabilitation, population augmentation, artificial cavity construction, additional private landowner initiatives, monitoring and surveys, and evaluation of habitat management options.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Appendix IV. Reptiles

Culebra Island giant anole

137

1. Species: Culebra Island giant anole (*Anolis roosevelti*)
2. Listing/Date: Endangered/July 21, 1977
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Culebra Island Giant Anole Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 28, 1983
9. Recovery Objective/Criteria: Downlist. Establish healthy population levels of lizards in expanded habitat.
10. Major Activity Since Last Report: One-year Puerto Rico Department of Natural Resources status survey (1987) on Culebra Island.
11. Major Activity Over Next Reporting Period: Department of Natural Resources suggested status survey on Vieques Island.
12. Recovery Achieved: 1
13. Information Current as of: July 6, 1990

Mona boa

138

1. Species: Mona boa (*Epicrates monensis monensis*)
2. Listing/Date: Threatened/February 3, 1978
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for the Mona Boa (*Epicrates monensis monensis*)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 1984.
9. Recovery Objective/Criteria: Stabilized/none specified
10. Major Activity Since Last Report: Trapping program for feral cats in Mona Island (Department of Natural Resources), and status review in April 1990.
11. Major Activity Over Next Reporting Period: Initial habitat surveys to localize the individuals in Mona Island.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

139 Puerto Rican boa

1. Species: Puerto Rican boa (*Epicrates inornatus*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Reptiles
4. Species Status: Stable
5. Recovery Priority: 14
6. Recovery Plan Title: Recovery Plan for the Puerto Rican Boa (*Epicrates inornatus*)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/March 27, 1986
9. Recovery Objective/Criteria: Delist/none specified
10. Major Activity Since Last Report: Boa habitat surveys conducted by Department of Natural Resources Status reviewed in April 1990.
11. Major Activity Over Next Reporting Period: Continue surveys.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

140 Virgin Islands tree boa

1. Species: Virgin Islands tree boa (*Epicrates monensis granti*)
2. Listing/Date: Endangered/December 7, 1979
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 3C
6. Recovery Plan Title: Virgin Islands Tree Boa Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/March 27, 1986
9. Recovery Objective/Criteria: Downlist within 10-year period.
10. Major Activity Since Last Report: Habitat protection through Section 7; captive breeding (Toledo Zoo); habitat characterization
11. Major Activity Over Next Reporting Period: Continuation of captive breeding and characterization of habitat
12. Recovery Achieved: 1
13. Information Current as of: July 7, 1990

American crocodile

141

1. Species: American crocodile (*Crocodylus acutus*)
2. Listing/Date: Endangered/September 25, 1975
3. Group: Reptiles
4. Species Status: Unknown.
5. Recovery Priority: 2C
6. Recovery Plan Title: American Crocodile Recovery Plan.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/February 2, 1984.
9. Recovery Objective/Criteria: Downlist/Reclassification could occur when the number of breeding females reaches a minimum of 60.
10. Major Activity Since Last Report: Continuation of mark-recapture and nest monitoring studies funded under Section 6 funds. Coordination with Department of Transportation on the reconstruction of U.S. Highway 1 and its impacts on crocodiles.
11. Major Activity Over Next Reporting Period: No new studies planned. Continuation of Section 6 funded studies.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Saltwater crocodile

142

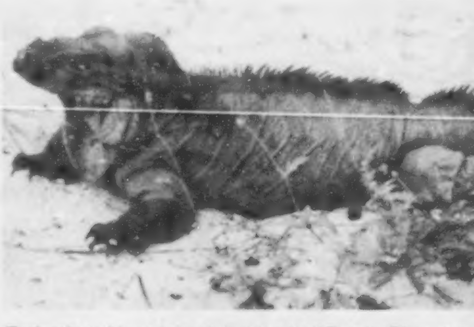
1. Species: Saltwater crocodile (*Crocodylus porosus*)
2. Listing/Date: Endangered/December 18, 1979
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 11
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Plan to conduct a population status survey in Belau in 1991.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

143 Monito gecko

1. Species: Monito gecko (*Sphaerodactylus micropithecus*)
2. Listing/Date: Endangered/October 15, 1982
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Monito Gecko Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/1986
9. Recovery Objective/Criteria: Stabilize
10. Major Activity Since Last Report: No status surveys conducted in recent years.
11. Major Activity Over Next Reporting Period: Assess the status of the species at Monito Island and the impact of feral rodents on the recruitment.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

144 Mona ground iguana

1. Species: Mona ground iguana (*Cyclura stejnegeri*)
2. Listing/Date: Threatened/February 3, 1978
3. Group: Reptiles
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Mona Iguana Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/1984
9. Recovery Objective/Criteria: Stabilize
10. Major Activity Since Last Report: An electric fence designed to keep feral goats and pigs out of the main nesting areas of the iguanas has been completed.
11. Major Activity Over Next Reporting Period: Assess the effectiveness of the electric fence in keeping feral mammals out of the nesting areas and determine the effects on the reproductive output and recruitment into the iguana population.
12. Recovery Achieved: 2
13. Information Current as of: July 1990



Endemic to Mona Island, just west of Puerto Rico, the Mona Island iguana is primarily threatened by introduced feral pigs that destroy the iguanas' nests.

Blunt-nosed leopard lizard

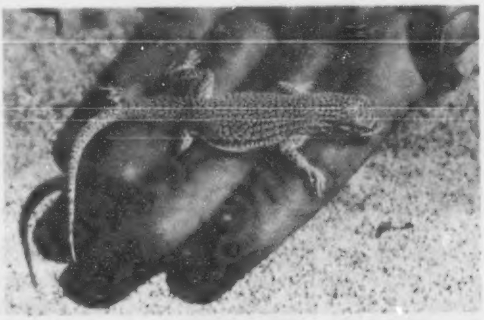
145

1. Species: Blunt-nosed leopard lizard (*Gambelia silus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Blunt-nosed Leopard Lizard Revised Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: R/Rev/1985
9. Recovery Objective/Criteria: Downlist when at least 9 reserves with a minimum of 6,000 contiguous acres, (totaling at least 55,000 acres) are secured throughout the lizards range supports a stable or increasing minimum density of 1 lizard per acre for 10 consecutive years.
10. Major Activity Since Last Report: Large land purchases and exchanges by the Bureau of Land Management and The Nature Conservancy in the southern portion of the range. Inventory on potentially good habitat in the northern range.
11. Major Activity Over Next Reporting Period: Continuation of #10. Completion of the recovery plans for the San Joaquin Valley listed species.
12. Recovery Achieved: 1
13. Information Current as of: July 20, 1990

Coachella Valley fringe-toed lizard

146

1. Species: Coachella Valley fringe-toed lizard (*Uma inornata*)
2. Listing/Date: Threatened/September 25, 1980
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Coachella Valley Fringe-Toed Lizard Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: R/F/September 11, 1985
9. Recovery Objective/Criteria: Delist. Establishment of two or more large-scale protected areas that maintain viable self-sustaining populations.
10. Major Activity Since Last Report: Continued implementation of conservation plan, including collection of development fees and acquisition and maintenance of habitat. Population monitoring efforts are continuing. Discussions with development proponents (including potentially massive flood control projects) adjacent to all three preserves are continuing. At this time, none of the preserves can be considered secure because of these threats.
11. Major Activity Over Next Reporting Period: Continuation of above activities and additional research on biology of the species.
12. Recovery Achieved: 2
13. Information Current as of: August 23, 1990



Known only from the Coachella Valley in southern California, the Coachella Valley fringe-toed lizard is threatened by encroaching development. To prevent the destruction of all remaining habitat, a habitat conservation plan was produced by developers, conservationists, and affected governmental agencies in 1989 in consultation with the Fish and Wildlife Service to set aside 5,260 hectares (13,000 acres) as the Coachella Valley Preserve and to allow development to proceed.

147 Island night lizard

1. Species: Island night lizard (*Xantusia riversiana*)
2. Listing/Date: Threatened/August 11, 1977
3. Group: Reptiles
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: California Channel Islands Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Eliminate threat from introduced goats, pigs, and cats.
10. Major Activity Since Last Report: Intensive efforts to eradicate feral goats, pigs, and cats continue.
11. Major Activity Over Next Reporting Period: Continued removal of feral animals.
12. Recovery Achieved: 3
13. Information Current as of: August 1990

148 St. Croix ground lizard

1. Species: St. Croix ground lizard (*Ameiva polops*)
2. Listing/Date: Endangered/June 3, 1977
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: Recovery Plan for the St. Croix Ground Lizard
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/March 29, 1984
9. Recovery Objective/Criteria: Downlist/Protect existing population at Green Cay. insure continued existence of the population at Protestant Cay, establish self-sustaining population on Buck Island.
10. Major Activity Since Last Report: Trapping of 10 individuals from Protestant Cay to be relocated to Ruth Cay, St. Croix. Survey after Hurricane Hugo.
11. Major Activity Over Next Reporting Period: Follow up on relocation program at Ruth Cay.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

New Mexico ridgenose rattlesnake 149

1. Species: New Mexico ridgenose rattlesnake (*Crotalus willardi obscurus*)
2. Listing/Date: Threatened/August 4, 1978
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: New Mexico Ridgenose Rattlesnake Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 22, 1985
9. Recovery Objective/Criteria: Stabilize/Few historic habitat sites remain; therefore, there is little chance to rear and transplant to new localities. The only realistic goal is to maintain and enhance existing populations to present further decline and possible extinction of the species.
10. Major Activity Since Last Report: Gray Ranch in southern New Mexico purchased by The Nature Conservancy. Therefore, the bulk of the habitat remaining in the U.S. will be protected.
11. Major Activity Over Next Reporting Period: Survey habitats on Gray Ranch.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

Blue-tailed mole skink 150

1. Species: Blue-tailed mole skink (*Eumeces egregius lividus*)
2. Listing/Date: Threatened/November 6, 1987
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Preliminary Project Proposal developed for refuge acquisition which would protect habitat. No recent action.
11. Major Activity Over Next Reporting Period: May have some state land acquisition projects in conjunction with plant protection.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

151

Sand skink

1. Species: Sand skink (*Neoseps reynoldsi*)
2. Listing/Date: Threatened/November 6, 1987
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 7
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Preliminary Project Proposal developed for scrub refuge acquisition which would protect habitat.
11. Major Activity Over Next Reporting Period: May have some state land acquisition projects in conjunction with plant protection.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

152

Atlantic salt marsh snake

1. Species: Atlantic salt marsh snake (*Nerodia fasciata taeniata*)
2. Listing/Date: Threatened/November 29, 1977
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 12
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U.
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Possible study of effects of open marsh water management on the Atlantic salt marsh snake. Study would be conducted by Volusia County Mosquito Control.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Concho water snake 153

Species: Concho water snake (*Nerodia harteri paucimaculata*)

Listing/Date: Threatened/September 3, 1986

Group: Reptiles

Species Status: Stable

Recovery Priority: 9C

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 2

Recovery Plan Stage/Date: Pending

Recovery Objective/Criteria: To be developed

10. Major Activity Since Last Report: Monitoring and various studies continued (as outlined in the Reasonable and Prudent Alternatives in a Section 7 biological opinion).
11. Major Activity Over Next Reporting Period: Continue implementation of Reasonable and Prudent Alternatives. Begin drafting Recovery Plan.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

Eastern indigo snake 154

1. Species: Eastern indigo snake (*Drymarchon corais couperi*)
2. Listing/Date: Threatened/January 31, 1978
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 12
6. Recovery Plan Title: Eastern Indigo Snake Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 22, 1982
9. Recovery Objective/Criteria: To ensure that numerous indigo snake populations exist and are reproducing and protected where suitable habitat still exists in the historical range of the species. Maintain and protect existing populations of eastern indigo snakes; reestablish populations where feasible; improve attitude of the public and their behavior toward snakes.
10. Major Activity Since Last Report: The Alabama Cooperative Wildlife Research Unit has released captive-reared indigo snakes in Florida, Alabama, Georgia, and Mississippi. Some of the releases have been successful.
11. Major Activity Over Next Reporting Period: Revise recovery plan and continue habitat research and captive release program.

Endemic to the Southeast, the eastern indigo snake is dependent upon the burrows of other species (such as the threatened gopher tortoise). The snakes use the burrows as a general refuge and for overwintering.

12. Recovery Achieved: 1
13. Information Current as of: July 1990

155 San Francisco garter snake

1. Species: San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: San Francisco Garter Snake Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 11, 1985
9. Recovery Objective/Criteria: Delist when at least 10 populations containing 200 snakes with a 50:50 sex ratio are maintained and protected for 15 consecutive years.
10. Major Activity Since Last Report: Radio telemetry life history study.
11. Major Activity Over Next Reporting Period: None
12. Recovery Achieved: 1
13. Information Current as of: July 17, 1990

156 Desert tortoise

1. Species: Desert tortoise (*Gopherus agassizii*), Mohave population
2. Listing/Date: Threatened/April 2, 1990
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 3C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Recovery team has been appointed.
11. Major Activity Over Next Reporting Period: Develop recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

The desert tortoise, a recently-listed species, is primarily threatened by disease, predation by ravens, vandalism, collectors, livestock grazing, and habitat disturbance by off-road vehicles. The Fish and Wildlife Service's recovery team will address these threats in an effort to develop a plan to halt the decline of the species and restore it to healthy numbers.

Gopher tortoise

157

1. Species: Gopher tortoise, western population (*Gopherus polyphemus*)
2. Listing/Date: Threatened/July 7, 1987
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Gopher Tortoise Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A
9. Recovery Objective/Criteria: Prevention from endangered status and delisting. Successful prevention of endangered status would be considered by evidence of an average of 5 gopher tortoises per hectare on deep sandy soils (1.52 meters (+/-)) for a period of 30 years on the DeSoto National Forest. For delisting, evidence is required of an average of 3 gopher tortoises per hectare on deep sandy soils (1.53 meters (+/-)) on private lands.
10. Major Activity Since Last Report: Completion of the final recovery plan, monitoring of habitat management on the DeSoto National Forest, completion of the U.S. Forest Service consultation on the habitat management chapter which governs gopher tortoise conservation on the DeSoto National Forest.
11. Major Activity Over Next Reporting Period: Completion of the final recovery plan, monitoring of habitat management on the DeSoto National Forest, implementation of baseline surveys and habitat assessments by the U.S. Forest service, and publication of an educational brochure for private landowners on longleaf pine management and gopher tortoise conservation.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Alabama red-bellied turtle

158

1. Species: Alabama red-bellied turtle (*Pseudemys alabamensis*)
2. Listing/Date: Endangered/June 17, 1987
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Alabama Red-bellied Turtle Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 8, 1990
9. Recovery Objective/Criteria: Downlist. Establish long-term protection for three nesting habitats; protect basking, feeding and overwintering habitats; and data collected over a 15-year period demonstrates that the population trend is increasing.
10. Major Activity Since Last Report: This is the first report.
11. Major Activity Over Next Reporting Period: Conduct studies to determine the turtle's population biology and ecology; locate major nesting habitats; locate basking and over-wintering habitats; and reduce mortality to all life stages.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

159 Flattened musk turtle

1. Species: Flattened musk turtle (*Sternotherus depressus*)
2. Listing/Date: Threatened/June 11, 1987
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 14
6. Recovery Plan Title: Flattened Musk Turtle Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/February 26, 1990
9. Recovery Objective/Criteria: Delisting. Delisting will require data that supports the existence of viable populations in at least 12 streams over a 10-year period.
10. Major Activity Since Last Report: This is the first report.
11. Major Activity Over Next Reporting Period: A work group will be established to assess the water quality problem. Studies will be conducted to determine the implications of decreased water quality and other threats. Protective actions will be taken as warranted.
12. Recovery Achieved: 1
13. Information Current as of: June, 1990

160 Green sea turtle

1. Species: Green sea turtle (*Chelonia mydas*)
2. Listing/Date: Endangered at breeding colonies in Florida and Pacific coast of Mexico/October 13, 1970; July 28, 1978. Threatened elsewhere/October 13, 1970; July 28, 1978.
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 8, 2C
6. Recovery Plan Title: Recovery Plan for Marine Turtles (NMFS)
7. Lead Region/Region Responsible for Recovery Plan: Region 2 and NMFS
8. Recovery Plan Stage/Date: R/F/September 19, 1984
9. Recovery Objective/Criteria: Not defined.
10. Major Activity Since Last Report: For threatened: Turtle Excluder Device (TED) regulations fully in force in the Gulf and southeastern U.S. For endangered: Standardized nest surveys in Florida. Mexican beach, turtle, and nest protection in Yucatan Peninsula and Michoacan.
11. Major Activity Over Next Reporting Period: For threatened: Foraging/habitat studies in Puerto Rico and U.S. Virgin Islands. For endangered: Mexican beach, turtle, and nest protection in Yucatan Peninsula and Michoacan. Acquisition of major nesting beaches in east Florida. Strengthen beach armoring regulations in Florida.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

Hawksbill sea turtle

161

1. Species: Hawksbill sea turtle (= carey) (*Eretmochelys imbricata*)
2. Listing/Date: Endangered/June 2, 1970
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 1C
6. Recovery Plan Title: Recovery Plan for Marine Turtles (NMFS) (revised, 1990)
7. Lead Region/Region Responsible for Recovery Plan: Region 2, 4, and NMFS
8. Recovery Plan Stage/Date: R/1990/F/September 19, 1984
9. Recovery Objective/Criteria: Not defined.
10. Major Activity Since Last Report: Monitoring and fencing nesting beaches in Puerto Rico. Law Enforcement activities. Section 7 habitat protection. Monitoring and protection of Mexican beaches in Yucatan and Campeche.
11. Major Activity Over Next Reporting Period: Continue monitor nesting beaches in Puerto Rico. Initiate foraging behavior studies. Nest surveys/protection at Buck Island, U.S. Virgin Islands. Monitoring and protection of Mexican beaches in Yucatan and Campeche.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

Kemp's ridley sea turtle

162

1. Species: Kemp's ridley sea turtle (*Lepidochelys kempii*)
2. Listing/Date: Endangered/December 2, 1970
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Recovery Plan for Marine Turtles (NMFS)
7. Lead Region/Region Responsible for Recovery Plan: Region 2 and NMFS
8. Recovery Plan Stage/Date: R/1990/F/September 19, 1984
9. Recovery Objective/Criteria: Downlist to Threatened if: Major nesting beach protected. Turtle Excluder Devices (TED) are enforced in shrimp trawls to mitigate fishing mortalities. Nesting females numbers increase to 40,000 at nesting beach.
10. Major Activity Since Last Report: Entered 13th year of cooperation with Mexico to fully protect nesting beach and monitor population trend. Monitor beaches in Vera Cruz for nesting turtles. TED's required on U.S. shrimp trawlers. Continuing analysis of distribution and migratory paths.
11. Major Activity Over Next Reporting Period: Cooperate with Mexico on major beach protection. Increase vigilance and enforcement of TED regulations. Expand TED regulations to cover areas and times where turtles present. Continue data collection on distribution and migratory paths.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

163 Leatherback sea turtle

1. Species: Leatherback sea turtle (*Dermochelys coriacea*)
2. Listing/Date: Endangered/June 2, 1970
3. Group: Reptiles
4. Species Status: Unknown
5. Recovery Priority: 7
6. Recovery Plan Title: Recovery Plan for Marine Turtles (NMFS) (revised, 1990)
7. Lead Region/Region Responsible for Recovery Plan: Region 2, 4, and NMFS
8. Recovery Plan Stage/Date: R/1990/F/September 19, 1984
9. Recovery Objective/Criteria: Not defined.
10. Major Activity Since Last Report: Nest surveys/protection on two major U.S. nesting beaches: Sandy Point, U.S. Virgin Islands, and Culebra, Puerto Rico. Beach and turtle protection in Guyana.
11. Major Activity Over Next Reporting Period: Nest surveys/protection on two major U.S. nesting beaches: Sandy Point, U.S. Virgin Islands, and Culebra, Puerto Rico. Establish beach and turtle protection in Pacific Mexico at Mexiquillo, Michoacan.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

164 Loggerhead sea turtle

1. Species: Loggerhead sea turtle (*Caretta caretta*)
2. Listing/Date: Threatened/July 28, 1978
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 7C
6. Recovery Plan Title: Recovery Plan for Marine Turtles (NMFS).
7. Lead Region/Region Responsible for Recovery Plan: Region 2, 4, and NMFS
8. Recovery Plan Stage/Date: R/1990/F/September 19, 1984
9. Recovery Objective/Criteria: Not defined.
10. Major Activity Since Last Report: Turtle Excluder Device (TED) regulation in force in the Gulf and southeastern U.S. Standardized nesting surveys on index beaches in Florida, North Carolina, and Georgia implemented.
11. Major Activity Over Next Reporting Period: Acquisition of high density nesting beaches in Florida for sea turtle refuge. Strengthen beach armoring regulations in Florida.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

Loggerhead hatchlings face enormous natural and human-related threats. In an effort to protect nesting beaches at Cape Canaveral National Seashore in Florida from predation, the Fish and Wildlife Service has coordinated with the Air Force and the National Park Service. Since protection efforts have been undertaken, the number of successful hatchlings has increased dramatically from 5 percent to 60 percent.

Olive (Pacific) ridley sea turtle

165

1. Species: Olive (Pacific) ridley sea turtle (*Lepidochelys olivacea*)
2. Listing/Date: Endangered at breeding colonies on Pacific Coast of Mexico/July 28, 1978. Threatened elsewhere/July 28, 1978.
3. Group: Reptiles
4. Species Status: Declining
5. Recovery Priority: 8C
6. Recovery Plan Title: Recovery Plan for Marine Turtles (NMFS)
7. Lead Region/Region Responsible for Recovery Plan: Region 2 and NMFS
8. Recovery Plan Stage/Date: F/September 19, 1984
9. Recovery Objective/Criteria: Not defined
10. Major Activity Since Last Report: For threatened: Beach and nest protection in Guyana. Beach and nest protection in Costa Rica. For endangered: Beach and nest protection, and slaughterhouse operations in Oaxaca, Mexico. Achieved complete ban on legal take of species in Mexico.
11. Major Activity Over Next Reporting Period: For threatened: Beach and nest protection Guyana. Beach and nest protection in Costa Rica. For endangered: Beach and nest protection, monitor/investigate implementation of and aid in maintaining the ban on take and trade, and initiate additional beach protection project in Oaxaca, Mexico.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

Plymouth red-bellied turtle

166

1. Species: Plymouth red-bellied turtle (*Pseudemys rubriventris bangsii*)
2. Listing/Date: Endangered/April 2, 1980
3. Group: Reptiles
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Plymouth Red-Bellied Turtle Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Rev/September 26, 1985
9. Recovery Objective/Criteria: Downlist/Can occur if the taxon increases to at least 15 self-sustaining populations with 600 breeding age individuals.
10. Major Activity Since Last Report: Headstarting and release of turtles in suitable habitat within the species' range. Predator control through the use of nest exclosures. Ongoing monitoring and surveys.
11. Major Activity Over Next Reporting Period: Headstarting turtles at the rate of 100 hatchlings/year will continue for 10 years. An inventory of the major population will be conducted, surveys of other ponds will continue, and a mark and recapture study will be conducted to determine the survival of wild (non-headstarted) turtles, which appears to be low at this point.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

167 Ringed sawback turtle

1. Species: Ringed sawback turtle (*Graptemys oculifera*)
2. Listing/Date: Threatened/December 23, 1986
3. Group: Reptiles
4. Species Status: Stable
5. Recovery Priority: 14
6. Recovery Plan Title: Ringed Sawback Turtle Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 8, 1988
9. Recovery Objective/Criteria: Delisting. Delisting the Ringed Sawback turtle will require providing secure habitat for the turtle in two stretches of the Pearl River (one upstream and one downstream of the Ross Barnett Reservoir), with at least 30 miles in either stretch, for a total protected area of 150 river miles.
10. Major Activity Since Last Report: The major ongoing activity has been mark and recapture research at selected localities on the Pearl River to form baseline estimates of the current population.
11. Major Activity Over Next Reporting Period: The major activity will be to conclude the population assessment research and analyze and present the results.
12. Recovery Achieved: 2
13. Information Current as of: June 1990

Appendix IV. Amphibians

Golden coqui 168

Species: Golden coqui (*Eleutherodactylus jasperi*)

Listing/Date: Threatened/November 11, 1977

Group: Amphibians

Species Status: Declining

Recovery Priority: 5C

Recovery Plan Title: Recovery Plan for the Golden Coqui (*Eleutherodactylus jasperi*)

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: F/January, 1984

9. Recovery Objective/Criteria: Delist/ The three populations should be stable or expanding, having a minimum of 1,000 individuals. The long-term habitat has been ensured for essential habitat of the three known populations. Habitat management plans for essential habitat are completed and provide a basis for long-term management of golden coqui habitat to insure sustained availability of required habitat conditions and reduce the likelihood of catastrophic losses.

10. Major Activity Since Last Report: Field surveys at Cayey to find the known populations. Status survey prepared by Department of Natural Resources. The status was reviewed in April 1990.

11. Major Activity Over Next Reporting Period: To continue field surveys at old localities to discover whether populations survive and to determine threats and biological limiting factors to remaining populations.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

Cheat Mountain salamander 169

Species: Cheat Mountain salamander (*Plethodon nettingi*)

Listing/Date: Threatened/August 18, 1989

Group: Amphibians

Species Status: Stable

Recovery Priority: 8

Recovery Plan Title: Draft Recovery Plan for the Cheat Mountain Salamander (*Plethodon nettingi*)

7. Lead Region/Region Responsible for Recovery Plan: Region 5

Recovery Plan Stage/Date: U/no date

Recovery Objective/Criteria: Delist / At least 30 stable and preferably increasing populations (15 in the southern and 15 in the northern portion of the range).

10. Major Activity Since Last Report: Life history and habitat disturbance studies, and habitat protection activities (primarily Sec. 7 actions). Several new sites were discovered; however, some historic sites failed to produce the species.

11. Major Activity Over Next Reporting Period: Continued monitoring and habitat protection.

12. Recovery Achieved: 2

13. Information Current as of: July 1990

170 Desert slender salamander

1. Species: Desert slender salamander (*Batrachoseps aridus*)
2. Listing/Date: Endangered/June 4, 1973
3. Group: Amphibians
4. Species Status: Unknown
5. Recovery Priority: 5C
6. Recovery Plan Title: Recovery Plan - Desert Slender Salamander
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/June 1982
9. Recovery Objective/Criteria: Stabilize habitat and population in Hidden Palms Canyon. Downlist to Threatened: Determine if second population exists in a completely different watershed. Given extremely limited distribution of species, it is unlikely that the species will be delisted.
10. Major Activity Since Last Report: California Department of Fish and Game has been conducting monthly surveys of Guadalupe Canyon during 1989. They are attempting to collect one individual from this location for genetic analysis.
11. Major Activity Over Next Reporting Period: Continue monitoring population. Acquire genetic information on population in Guadalupe Canyon.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

171 Red Hills salamander

1. Species: Red Hills salamander (*Phaeognathus hubrichti*)
2. Listing/Date: Threatened/December 3, 1976
3. Group: Amphibians
4. Species Status: Declining
5. Recovery Priority: 7
6. Recovery Plan Title: Red Hills Salamander Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 23, 1983
9. Recovery Objective/Criteria: Delist. Habitat reassessment; preserve and/or manage habitat (16,000 hectares of good to optimal habitat).
10. Major Activity Since Last Report: A reexamination of the status of the Red Hills salamander was completed in September 1988. The report identifies 23 populations to be protected and outlines compatible land use activities.
11. Major Activity Over Next Reporting Period: Recommendations contained in the reexamination report concerning protection of certain populations and compatible land use practices.

Native only to the Red Hills region of Alabama, the Red Hills salamander is threatened by intensive logging of its restrictive habitat. The species is found mainly in mature hardwood forests underlain by siltstone.

12. Recovery Achieved: 1
13. Information Current as of: June 1990

San Marcos salamander

172

1. Species: San Marcos salamander (*Eurycea nana*)
2. Listing/Date: Threatened/July 14, 1980
3. Group: Amphibians
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: San Marcos Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: R/F/April 8, 1985
9. Recovery Objective/Criteria: Delist when continued flow in San Marcos River is ensured. This objective and criteria will likely be amended in the Recovery Plan revision that is under way.
10. Major Activity Since Last Report: Preliminary results from a Section 6 study showed that the salamanders in the Comal Springs are not *Eurycea nana*, indicating that the San Marcos salamander is more limited in distribution than originally thought (now only known from one location). A captive breeding techniques and ecology study was started.
11. Major Activity Over Next Reporting Period: Continue captive breeding techniques and ecology study. Should it become necessary to temporarily bring this species into captivity if spring flows drop critically low, the techniques for captive breeding will be available.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

Santa Cruz long-toed salamander

173

1. Species: Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Amphibians
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Santa Cruz Long-toed Salamander Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/Unpublished revision/November 14, 1986
9. Recovery Objective/Criteria: Establish secure populations
10. Major Activity Since Last Report: Significant habitat loss has occurred due to 1) disking and filling of breeding ponds at McCloskey Slough and 2) tree cutting and livestock grazing at Moro Cojo. Several new populations have recently been discovered.
11. Major Activity Over Next Reporting Period: The Nature Conservancy may conduct work to address salt water intrusion at Struve Pond.
12. Recovery Achieved: 1
13. Information Current as of: August 1, 1990

174 Shenandoah salamander

1. Species: Shenandoah salamander (*Plethodon shenandoah*)
2. Listing/Date: Endangered/August 18, 1989
3. Group: Amphibians
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: N/A
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: N/A
9. Recovery Objective/Criteria: N/A
10. Major Activity Since Last Report: Searches for additional populations; one population was found. Also, gypsy moth control was conducted at the four known population sites, to determine if infestation is a problem. The National Park Service prepared a management plan for the species.
11. Major Activity Over Next Reporting Period: Continued experimentation with gypsy moth spraying, and evaluation of salamander abundance at both sprayed and untreated sites. Assessment of effects of competition with the red-backed salamander.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

175 Texas blind salamander

1. Species: Texas blind salamander (*Typhlomolge rathbuni*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Amphibians
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: NA
10. Major Activity Since Last Report: None. Continuing efforts by many agencies to protect the Edward's Aquifer from drawdown and pollution benefit this species. No other recovery actions are possible for this subterranean animal.
11. Major Activity Over Next Reporting Period: Continue efforts to protect Edward's Aquifer from drawdown and pollution.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

Houston toad 176

Species: Houston toad (*Bufo houstonensis*)

Listing/Date: Endangered (w/ critical habitat)/October 13, 1970

Group: Amphibians

Species Status: Unknown

Recovery Priority: 5C

Recovery Plan Title: Recovery Plan for the Houston Toad (*Bufo houstonensis*)

Lead Region/Region Responsible for Recovery Plan: Region 2

Recovery Plan Stage/Date: F/September 17, 1984

Recovery Objective/Criteria: Stabilize. Downlisting to be considered when (1) self-sustaining populations occur in two counties in addition to Bastrop and Burleson Counties, and (2) survival of existing populations in Bastrop and Burleson Counties is assured. Delisting considered when self-sustaining breeding populations exist in five or more counties.

10. Major Activity Since Last Report: Searches for new populations continued. Toads were heard calling at two new sites, one each in Colorado and Burleson Counties, but no individuals were seen or counted at these sites. The Leon County site was revisited and six individuals were collected for later taxonomic analysis. Nineteen other counties have been searched with negative results. Approximately 350 toads of the Bastrop County population were PIT tagged as part of an autecology study to determine population size, phenology, and other life history characteristics. Taxonomic studies are underway to evaluate relationship with (*Bufo americanus charlesmithi*). Six were collected for planned electrophoretic work. The Houston Zoo has reduced its captive propagation effort. A total of six adults will remain there for research purposes.

11. Major Activity Over Next Reporting Period: Searches for new populations will continue and expand. The ecology study on the Bastrop County population will continue.

12. Recovery Achieved: 1

13. Information Current as of: July 26, 1990

Puerto Rican crested toad 177

Species: Puerto Rican crested toad (*Peltophryne lemur*)

Listing/Date: Threatened/August 4, 1987

Group: Amphibians

Species Status: Unknown

5. Recovery Priority: 2C

6. Recovery Plan Title: Puerto Rican Crested Toad Recovery Plan

7. Lead Region/Region Responsible for Recovery Plan: Region 4

8. Recovery Plan Stage/Date: A

9. Recovery Objective/Criteria: Stabilize. Develop a wild crested toad population that is demographically stable.

10. Major Activity Since Last Report: Continuation of captive breeding and release; protection of breeding habitat; monitoring of reproductive success; preparation of draft Captive Master Plan.

11. Major Activity Over Next Reporting Period: Continuation of captive breeding and release; development of method of monitoring success of release; north-south coast population genetic studies.

12. Recovery Achieved: 1

13. Information Current as of: July 7, 1990

178 Wyoming toad

1. Species: Wyoming toad (*Bufo hemiophrys baxteri*)
2. Listing/Date: Endangered/January 17, 1984
3. Group: Amphibians
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Wyoming Toad Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: T
9. Recovery Objective/Criteria: Downlist—when existing population becomes secure and 5 new secure populations of at least 100 adults have been established in the Laramie Basin.
10. Major Activity Since Last Report: Two reintroduction sites have been identified. Twelve young and subadult toads were captured and transferred to Sybille, WY, for captive propagation purposes. Toad censuses were conducted to determine population numbers, breeding adults, and young survival. The Nature Conservancy has leased 20 acres of toad habitat and has an option to buy 1,800 acres of important toad habitat. The Service has begun actions to acquire these lands from the Conservancy for inclusion in the refuge system. A hard winter last year caused a significant loss in the population, which is currently recovering. This population variation appears to a cyclical situation.
11. Major Activity Over Next Reporting Period: Analyses will be made on the number of eggs masses which need to be collected for establishment of new po lations and whether these egg masses can be taken from the wild or from captive populatio The recovery plan will be fina ized. Population monitoring w continue and a biological and ecological study will be condu ed to document movements/di persion of toads and hibernati areas. An additional 25 young toads will be taken into captiv for supplementing the captive population. Water quality sam will be analyzed for establishment of a baseline of ter quality conditions in know and potential habitats.
12. Recovery Achieved: 1
13. Information Current as of: Jul 1990

Appendix IV. Fishes

Yaqui catfish 179

1. Species: Yaqui catfish (*Ictalurus pricei*)
2. Listing/Date: Threatened/August 31,1984
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Stabilize. Reintroduce Yaqui catfish into historical habitat on the San Bernardino NWR where it is currently extirpated.
10. Major Activity Since Last Report: A collection permit for Yaqui catfish was obtained from the Mexican government in the spring of 1990. Refuge staff assisted Arizona Game & Fish and Dexter National Fish Hatchery (NFH) personnel in collecting broodstock from the Rio Sirupa, a tributary of the Rio Yaqui in Chihuahua, Mexico in April 1990. Approximately 230 fish were taken to Dexter NFH from Mexico. Fish are currently being studied to determine if they are "pure" Yaqui catfish.
11. Major Activity Over Next Reporting Period: Electrophoretic work will be started on stock of Yaqui catfish at Dexter NFH. If determined to be pure Yaqui they will be encouraged to spawn next spring for eventual reintroduction to the wild in the fall of 1991 or in 1992.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Alabama cavefish 180

1. Species: Alabama cavefish (*Speoplatyrhinus poulsoni*)
2. Listing/Date: Endangered/September 28, 1988
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 1
6. Recovery Plan Title: Second Revision of Recovery Plan Alabama Cavefish Speoplatyrhinus poulsoni Cooper and Kuehne 1974
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/September 23, 1985
9. Recovery Objective/Criteria: Downlist. Find three viable populations in discontinuous aquatic systems outside the Key Cave area. Protect the recharge areas for all four populations. Downlist when all four populations are demonstrated to be stable or increasing as evidenced by monitoring over a 20-year period.
10. Major Activity Since Last Report: No action taken.
11. Major Activity Over Next Reporting Period: The recovery plan will be finalized.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

181 Ozark cavefish

1. Species: Ozark cavefish (*Amblyopsis rosae*)
2. Listing/Date: Threatened/November 1, 1988
3. Group: Fishes
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: A Recovery Plan for the Ozark Cavefish (*Amblyopsis rosae*).
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/November 14, 1989.
9. Recovery Objective/Criteria: Delist. Nine caves and important components of their recharge areas are protected, including Cave Springs Cave, Arkansas, and the cavefish population in each of these caves remains stable or increasing as evidenced by systematic observations over at least a 10-year period.
10. Major Activity Since Last Report: New populations were discovered in Missouri.
11. Major Activity Over Next Reporting Period: Additional searches for new populations. Population survey of known populations in Arkansas to continue data on population trends.
12. Recovery Achieved: 2
13. Information Current as of: June 1990

182 Bonytail chub

1. Species: Bonytail chub (*Gila elegans*)
2. Listing/Date: Endangered/April 23, 1980
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Bonytail Chub Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Rev/September 4, 1990; F/May 16, 1984
9. Recovery Objective/Criteria: Stabilize —The bonytail chub is extremely rare and very few individuals have been identified in the wild. The immediate recovery goal is to prevent extinction by directing initial efforts toward securing and developing a broodstock, reintroducing wild or hatchery-produced bonytail chub within its historical range, obtaining necessary ecological information, and reevaluating the taxonomic status of the *Gila* complex.
10. Major Activity Since Last Report: The Service has begun implementing a propagation and genetics management program. Breeding biology has been successfully worked out and a broodstock has been established. Restocking has occurred in Mohave Lake in the Lower Basin. The "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" entered its third year and a $2.8 million work plan covering 44 high priority recovery activities was developed by the Implementation Committee for FY 90. The Bonytail Chub Recovery Plan revision underwent agency and public review and was finalized. The Service is refining recommendations for flow needed to maintain species' habitat and has begun investigations to acquire needed water rights.
11. Major Activity Over Next Reporting Period: Implementation of the Recovery Program, including the propagation and genetics studies, will be continued. Investigations will continue for the purpose of identifying reintroduction sites. The Service will begin taxonomic studies on various fish of the genus *Gila*. Work will continue to investigate water rights acquisition and in development and implementation of the FY 91 recovery work plan.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Borax Lake chub 183

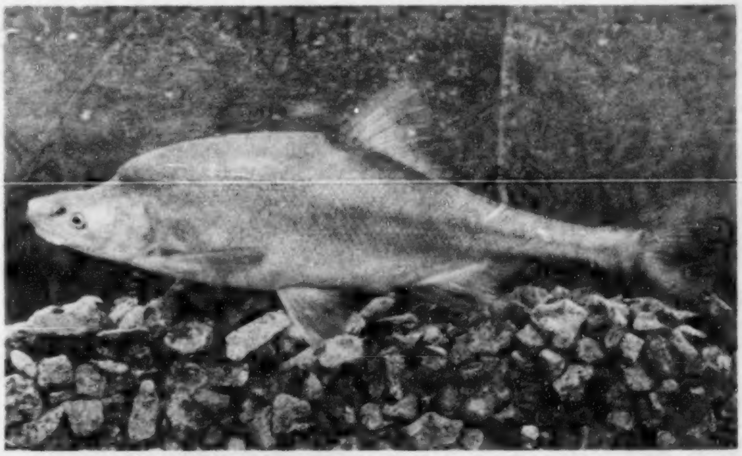
1. Species: Borax Lake chub (*Gila boraxobius*)
2. Listing/Date: Endangered/October 5, 1982
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for the Borax Lake Chub
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/February 1987
9. Recovery Objective/Criteria: Stabilize/secure habitat; Maintain water quality and quantity for Borax Lake and adjacent marshes.
10. Major Activity Since Last Report: The Bureau of Land Management (BLM) is in informal Section 7 consultation with the Service on geothermal exploratory drilling by Anadarko Corporation; an Environmental Assessment is currently under review. BLM has installed a weather station to monitor ambient temperature and weather data at Borax Lake. A management burn was undertaken by BLM in 1990 to rehydrate adjacent marsh; however, the effort has been ineffectual.
11. Major Activity Over Next Reporting Period: BLM intends to establish a long-term monitoring program for water quality, temperature and water quantity. The Nature Conservancy will continue to monitor the population and seek opportunities for land acquisition.
12. Recovery Achieved: 2
13. Information Current as of: July 24, 1990

Chihuahua chub 184

1. Species: Chihuahua chub (*Gila nigrescens*)
2. Listing/Date: Threatened/October 11, 1983
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Chihuahua Chub Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/April 14, 1986
9. Recovery Objective/Criteria: Delist/Secure, via easement, purchase or other legal agreement spring-fed habitat where species occurs in the U.S. and establish two additional populations in historical range.
10. Major Activity Since Last Report: Stream survey work in Chihuahua, Mexico. Continued efforts to secure spring-fed habitats in Mimbres River drainage.
11. Major Activity Over Next Reporting Period: Secure adequate habitat to prevent extinction of the species in the U.S.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

185 Humpback chub

1. Species: Humpback chub (*Gila cypha*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2C
6. Recovery Plan Title: Humpback Chub Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Rev/September 19, 1990; Rev/May 15, 1984;
9. Recovery Objective/Criteria: Downlisting—five self-sustaining populations are identified and restored. The criteria for self-sustaining populations are currently unknown. Delisting—these five populations and their habitats are protected and in addition at least two refugia are established to prevent catastrophic loss.
10. Major Activity Since Last Report: The "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" entered its third year and a $2.8 million work plan covering 44 high priority recovery activities was developed by the Upper Basin Recovery Program Implementation Committee for FY 90. The Humpback Chub Recovery Plan revision underwent agency and public review and was finalized. The Service is refining recommendations for flow needed to maintain species' habitat and has begun investigations to acquire needed water rights.
11. Major Activity Over Next Reporting Period: The Service will begin taxonomic studies on various fish of the genus *Gila*, including this species. Work will continue to investigate water rights acquisition and in development and implementation of the FY 91 recovery work plan. Bureau of Reclamation will be conducting an intensive study of this species' habitat requirements in the tributaries of Lake Mead to use in analyzing proposed changes to Glenn Canyon Dam operations. Efforts will be undertaken to set up a refugium population and a captive breeding population of this species.
12. Recovery Achieved: 1
13. Information Current as of: September 1990



Native to the Colorado River Basin, the humpback chub is one of the endangered fishes targeted in a cooperative recovery program for fishes of the Colorado River Basin. The program involves maintaining stream flow, restocking, and monitoring.

Hutton Spring tui chub 186

Species: Hutton Spring tui chub (*Gila bicolor* undescribed subspecies)

Listing/Date: Threatened/March 28, 1985

Group: Fishes

Species Status: Unknown

Recovery Priority: 9

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: Pending

9. Recovery Objective/Criteria: To be developed.

10. Major Activity Since Last Report: None

11. Major Activity Over Next Reporting Period: None anticipated

12. Recovery Achieved: 2

13. Information Current as of: August 23, 1990

Mohave tui chub 187

Species: Mohave tui chub (*Gila bicolor mohavensis*)

Listing/Date: Endangered/October 13, 1970

Group: Fishes

Species Status: Declining

Recovery Priority: 6C

Recovery Plan Title: Mohave Tui Chub Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: F/September 1984

Recovery Objective/Criteria: Downlist Criteria in Recovery plan call for 6 refugia populations, stable for at least 5 years. Delist Criteria in Recovery Plan above, plus reestablishment in the Mojave River. There has been discussion among advisory team members regarding the need to increase the time for determination of a stable population to 10 years; many refugia have failed at the 5 year period.

10. Major Activity Since Last Report: Routine maintenance of MC Spring has been contracted to Desert Studies Consortium; this should ensure timely completion of vegetation removal. Population at China Lake is threatened by upcoming alteration of water supply. Ventura staff is working with the Navy and the City of Ridgecrest to attempt to ensure viability of this population. California Department of Fish and Game has initiated preliminary attempts to introduce chub into an additional refugium. A small oil spill at Fort Soda had potential to contaminate a chub population there. Environmental Contaminant staff from Laguna Niguel Field Office (FWS) worked with the Bureau of Land Management to correct problems. Disease outbreak at Camp Cady refugium may have significantly reduced the chub population at the one remaining pond there.

11. Major Activity Over Next Reporting Period: Recommended actions include: Dredging of West Pond at Fort Soda to establish third refugium there. Bureau of Land Management has $15,000 of $75,000 needed for work; Establishment of additional refugia in cooperation with California Department of Fish and Game; Stabilization of refugium at California Department of Fish and Game's Camp Cady refugium; Investigate potential for re-introductions into Mojave River at Afton Canyon; Reviewing adequacy of recovery plan.

12. Recovery Achieved: 1

13. Information Current as of: August 1990

188 Owens tui chub

1. Species: Owens tui chub (*Gila bicolor snyderi*)
2. Listing/Date: Endangered/August 5, 1985
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 6C
6. Recovery Plan Title: Recovery Plan for the Owens Tui Chub
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: TA/1990
9. Recovery Objective/Criteria: Reclassification to threatened. Elimination of threats to existing populations, and to successfully reintroduce chubs into other secure habitats.
10. Major Activity Since Last Report: Research on life history. Discovery of a new population. Survey of Owens Gorge for additional populations.
11. Major Activity Over Next Reporting Period: Protection of habitat at existing locations.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

189 Pahranagat roundtail chub

1. Species: Pahranagat roundtail chub (*Gila robusta jordani*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: Pahranagat Roundtail Chub Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 28, 1986
9. Recovery Objective/Criteria: Downlisting to threatened—three established populations for at least 5 years without being threatened by man-caused activities; Delisting—rehabilitate natural habitats within historic range through removal of exotic species and creating preferred chub habitat. When reestablished, self-sustaining chub populations will occupy as much as 1% of historic range.
10. Major Activity Since Last Report: Completion of research project by Service's Seattle Fisheries Research Lab on chub foraging behavior, habitat electivity, and reproduction, and distribution and relative abundance of all fishes in the Pahranagat River system.
11. Major Activity Over Next Reporting Period: Continue efforts to secure habitats through purchase/easement; remove exotics; restock with captive-propagated fish from Dexter National Fish Hatchery.
12. Recovery Achieved: 1
13. Information Current as of: July 25, 1990

Slender chub 190

Species: Slender chub (*Hybopsis cahni*)

Listing/Date: Threatened/ September 9, 1977

Group: Fishes

Species Status: Unknown

Recovery Priority: 11

Recovery Plan Title: Slender Chub Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: F/July 29, 1983

Recovery Objective/Criteria: Delist. Establish three viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.

10. Major Activity Since Last Report: Propagation research is being conducted at the Virginia Cooperative Fish and Wildlife Research Unit.
11. Major Activity Over Next Reporting Period: Complete current propagation research in the next year.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Sonora chub 191

1. Species: Sonora chub (*Gila ditaenia*)
2. Listing/Date: Threatened/April 30, 1986
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 11
6. Recovery Plan Title: Sonora Chub Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: A/June 7, 1988
9. Recovery Objective/Criteria: Stabilization
10. Major Activity Since Last Report: The Forest Service is conducting a study of habitat needs and biology of the Sonora chub in the United States. Distributional surveys in Mexico are being conducted by the Centro Ecologico de Sonora in Hermosillo, Mexico. Efforts are underway to solve the problem of trespass grazing in the only Sonora chub habitat in the United States, located on the Coronado National Forest.
11. Major Activity Over Next Reporting Period: Section 7 protection, studies
12. Recovery Achieved: 1
13. Information Current as of: July 1990

192 Spotfin chub

1. Species: Spotfin chub (*Cyprinella (= Hypobsis) monacha*)
2. Listing/Date: Threatened/September 9, 1977
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 11
6. Recovery Plan Title: Spotfin Chub Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 21, 1983
9. Recovery Objective/Criteria: Delist. Protect four present populations and discover and/or create three additional populations.
10. Major Activity Since Last Report: Reintroduced species into Abrams Creek, Monroe County, Tennessee. Propagation research is being conducted at the Virginia Cooperative Fish and Wildlife Research Unit.
11. Major Activity Over Next Reporting Period: Continue reintroduction and complete current propagation research in the next year.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

193 Virgin River chub

1. Species: Virgin River chub (*Gila robusta semidnuda*)
2. Listing/Date: Endangered/August 24, 1989
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 3C
6. Recovery Plan Title: Virgin River Endangered Fishes Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Under development
10. Major Activity Since Last Report: A program is underway to eradicate the non-native red shiner from a 21-mile reach of the Virgin River. Several hundred salvaged chubs from treated reaches in addition to several thousand young were released back into the river. Eradication has been successful in a 6-mile reach and the area is now available for reintroduction. Further treatments are planned to complete red shiner eradication and make additional river habitat available for species reintroduction.
11. Major Activity Over Next Reporting Period: Eradication of the red-shiner will continue as will reintroduction of the chub into available quality habitat. Virgin River Endangered Fishes Recovery Plan will be prepared and reviewed.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Yaqui chub 194

Species: Yaqui chub (*Gila purpurea*)

Listing/Date: Endangered/August 31, 1984

Group: Fishes

Species Status: Stable

5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Downlist
10. Major Activity Since Last Report: Yaqui chubs have been introduced into four additional ponds on the San Bernardino National Wildlife Refuge. These ponds are supplied by artesian well outflows and populations are increasing. Due to severe drought in southeast Arizona populations of Yaqui chub in Black Draw and Leslie Creek were hard hit. Both streams dried to a small number of deep pools where reduced numbers of fish survived.
11. Major Activity Over Next Reporting Period: Creation and improvement of aquatic habitats for Yaqui chub on San Bernardino National Wildlife Refuge. Locate suitable areas off refuge for possible genetic data on all populations of Yaqui chub.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Cui-ui 195

1. Species: Cui-ui (*Chasmistes cujus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Unknown, presumed stable
5. Recovery Priority: 2C
6. Recovery Plan Title: Cui-ui Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: R/Rev/November 22, 1983
9. Recovery Objective/Criteria: No quantitative criteria established. Overall objective is to restore and maintain an optimum self-sustaining population of cui-ui in the Truckee River/Pyramid Lake system through rehabilitating essential habitat, protecting and managing the cui-ui population, and informing the public of the restoration effort.
10. Major Activity Since Last Report: 1) Initiation of a 5-year research study by the Seattle National Fisheries Research Lab of cui-ui life history requirements. 2) Introduction of Senate Bill 1554 by Senator Harry Reid to resolve Truckee River water issues. 3) Formation of a Cui-ui Recovery Team.
11. Major Activity Over Next Reporting Period: 1) Quantification of recovery objectives/criteria by the Recovery Team. 2) Continuation of life history research project. 3) Continuation of negotiation process to allow passage of Senate Bill 1554.
12. Recovery Achieved: 2
13. Information Current as of: July 25, 1990

196 Ash Meadows speckled dace

1. Species: Ash Meadows speckled dace (*Rhinichthys osculus nevadensis*)
2. Listing/Date: Endangered/September 2, 1983
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following 7 conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish. Delisting—following criteria must be met for 5 years following downlisting: secure corridors for listed plant species within essential habitat; reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and 4 candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Initiation of multi-year research program by Seattle National Fisheries Center, utilizing Section 6 funding from the Nevada Dept. of Wildlife, to determine life history patterns of endemic fishes and aquatic invertebrates, and determine impacts of exotic species on endemic fishes and aquatic invertebrates.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September, 1990

197 Blackside dace

1. Species: Blackside dace (*Phoxinus cumberlandensis*)
2. Listing/Date: Threatened/June 12, 1987
3. Group: Fishes4. Species Status: Unknown 5. Recovery Priority: 11
6. Recovery Plan Title: Blackside Dace Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 17, 1988
9. Recovery Objective/Criteria: Delist. Establish 18 viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: No recovery activities have been conducted on the species since completion of a U.S. Forest Service funded life history study in 1988.
11. Major Activity Over Next Reporting Period: The U.S. Forest Service is reviewing a reintroduction project for FY 91 funding.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Clover Valley speckled dace 198

1. Species: Clover Valley speckled dace (*Rhinichthys osculus oligoporus*)
2. Listing/Date: Endangered/October 10, 1989
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 9C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: No previous report completed; this species was only recently listed. Status report completed in 1984 found only 2 populations. In 1988, a third locality was documented.
11. Major Activity Over Next Reporting Period: None anticipated
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Desert dace 199

1. Species: Desert dace (*Eremichthys acros*)
2. Listing/Date: Threatened/ December 10, 1985
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 7C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To secure water quantity and quality in springs and outflows, and secure habitat from human disturbance.
10. Major Activity Since Last Report: Status report completed in 1988. Negotiation under way between new landowners and the Bureau of Land Management to facilitate a land sale and/or exchange.
11. Major Activity Over Next Reporting Period: Continue process to accomplish land exchange/sale.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

200 Foskett speckled dace

1. Species: Foskett speckled dace (*Rhinichthys osculus*)
2. Listing/Date: Threatened/March 28, 1985
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 9
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: Secure and maintain two populations.
10. Major Activity Since Last Report: Monitor two existing populations.
11. Major Activity Over Next Reporting Period: Continue monitoring of two populations and enhance habitat at second population site.
12. Recovery Achieved: 2
13. Information Current as of: August 23, 1990

201 Independence Valley speckled dace

1. Species: Independence Valley speckled dace (*Rhinichthys osculus lethoporus*)
2. Listing/Date: Endangered/October 10, 1989
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 6C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Species only recently listed. Status report completed in 1984 documented presence in only one locality.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Kendall Warm Springs dace 202

1. Species: Kendall Warm Springs dace (*Rhinichthys osculus thermalis*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 12
6. Recovery Plan Title: Kendall Warm Springs Dace Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/July 12, 1982
9. Recovery Objective/Criteria: Protect and maintain the population and its habitat while verifying taxonomic validity of the subspecies.
10. Major Activity Since Last Report: Taxonomic validity has been verified. In FY 90, a fence was constructed around dace habitat on Forest Service land to protect the habitat from livestock grazing. The Forest Service is developing stream habitat improvements on the Green River Lakes road by removing culverts and excess road fill to improve stream flow gradients and increase dace habitat. Alternative locations for the Union Pass Road are also being considered by the Forest Service, which includes options supported by the Fish and Wildlife Service to relocate the Green River Lakes road currently crossing dace habitat.
11. Major Activity Over Next Reporting Period: Continue work with Forest Service to resolve conflicts from Union Pass road construction. Conduct a hydrologic study to identify impacts from relocating Green River Lakes road. The Fish and Wildlife Service will be coordinating with the Forest Service to designate dace habitat as an Research Natural Area, and to improve the public education exhibit where Green River Lakes road crosses dace habitat to prevent accidental harm or disturbance.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Moapa dace 203

1. Species: Moapa dace (*Moapa coriacea*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 1
6. Recovery Plan Title: Moapa Dace Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/February 14, 1983
9. Recovery Objective/Criteria: To protect and rehabilitate adequate habitat within the historical range of the Moapa dace to delist the species. Reclassification to threatened will be considered following protection and rehabilitation of at least 3 springs with self-sustaining populations and 2 miles of stream habitat.
10. Major Activity Since Last Report: Construction of approximately 400 feet of artificial channel to enhance Moapa dace habitat, effectively doubling size of the total dace habitat on the refuge. Numbers of adult dace have increased approximately 25%. The springfish population has also increased.
11. Major Activity Over Next Reporting Period: Remove approximately 50 palm trees around springs and along outflows, and encourage growth of native deciduous trees. Attempt to remove exotic fishes (mosquitofish and shortfin mollies) in fall of 1990.
12. Recovery Achieved: 2
13. Information Current as of: July 25, 1990

204 Amber darter

1. Species: Amber darter (*Percina antesella*)
2. Listing/Date: Endangered/August 5, 1985
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Conasauga Logperch and Amber Darter Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/June 20, 1986
9. Recovery Objective/Criteria: Downlist. Establish two viable populations through the protection of existing population and through the discovery and/or creation of an additional population.
10. Major Activity Since Last Report: A life history and threat analysis project is presently being conducted under a Section 6 project with the Tennessee Wildlife Resources Agency and Georgia Department of Natural Resources.
11. Major Activity Over Next Reporting Period: Current Section 6 project will end next year.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

205 Bayou darter

1. Species: Bayou darter (*Etheostoma rubrum*)
2. Listing/Date: Threatened/September 25, 1975
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 8C
6. Recovery Plan Title: Revised Recovery Plan for the Bayou Darter
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: R/F/September 8, 1983
9. Recovery Objective/Criteria: Delist. Stable or increasing population and habitat over at least a 10-year period in Bayou Pierre and Foster Creek; evidence of continued existence of species in White Oak and Turkey Creek; data on fluvial geomorphic processes operating in the Bayou Pierre system which supports the delisting of the species; established continuing plan of periodic monitoring of population trends and habitat suitability; and protection of *E. rubrum* habitat.
10. Major Activity Since Last Report: No action.
11. Major Activity Over Next Reporting Period: A study of the fluvial geomorphic processes operating in Bayou Pierre funded by Section 6.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Boulder darter 206

1. Species: Boulder darter (*Etheostoma wapiti*)
2. Listing/Date: Endangered/September 1, 1988
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Boulder Darter Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 27, 1989
9. Recovery Objective/Criteria: Delist. Establish three viable populations through the protection of the existing population and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Life history and propagation research is being conducted at the Service's Gainesville, Florida, research facility.
11. Major Activity Over Next Reporting Period: Continue current research and attempt to establish a joint Alabama/Tennessee Section 6 project.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Fountain darter 207

1. Species: Fountain darter (*Etheostoma fonticola*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: San Marcos Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: R/F/April 8, 1985
9. Recovery Objective/Criteria: Downlist/when flow in San Marcos River is assured. This objective and criteria will likely be modified in the revised Recovery Plan.
10. Major Activity Since Last Report: A River Management Plan is being developed (with Section 6 funds) to address local threats and outline management and protection needs. Aquifer water user groups have been meeting to try to develop a water use plan agreeable to all. Hopefully, this plan will provide for maintaining critical spring flows. Several hundred darters were brought into captivity for temporary holding as flow from the Comal Springs dropped to a critical low level and it looked as if habitat there might completely dry up. Section 6 study begun to investigate severe loss of vegetation in Comal Springs, possibly due to exotic snail.
11. Major Activity Over Next Reporting Period: River Management Plan will be completed and ready for implementation. Hopefully aquifer user groups will come to an agreement for using water that will provide for spring flow maintenance.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

208 Leopard darter

1. Species: Leopard darter (*Percina pantherina*)
2. Listing/Date: Threatened/January 27, 1978
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 17
6. Recovery Plan Title: Recovery Plan for the Leopard Darter (*Percina pantherina*)
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: R/F/September 20, 1984
9. Recovery Objective/Criteria: Delist
10. Major Activity Since Last Report: Relocated darters that would have been harmed by pipeline construction. Realty updated land ownership maps along the Glover River in relation to potential land acquisition/protection
11. Major Activity Over Next Reporting Period: Complete revision of recovery plan. Prepare a brochure on the ecology and distribution of the species. Continue habitat preservation efforts.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

209 Maryland darter

1. Species: Maryland darter (*Etheostoma sellare*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: The Maryland Darter Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Rev/September 25, 1985; F/February 2, 1982
9. Recovery Objective/Criteria: Stabilize/Protect and enhance the present population and habitat of the Maryland darter. Consider downlisting if 6 additional self-sustaining populations are found in dispersed locations.
10. Major Activity Since Last Report: Surveys and habitat protection. The Maryland darter has not been seen since 1988; its habitat appears to be declining (water quality).
11. Major Activity Over Next Reporting Period: Monitor known population and/or habitat to determine if the species is extant.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Niangua darter 210

1. Species: Niangua darter (*Etheostoma nianguae*)
2. Listing/Date: Threatened/June 12, 1985
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: A Recovery Plan for the Niangua Darter
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/July 17, 1989
9. Recovery Objective/Criteria: Delist. The species will be considered to be recovered when 1) the eight known populations are protected and shown to be stable or increasing in size, and 2) populations are discovered or established in four additional stream drainages, similarly protected, and shown to be viable.
10. Major Activity Since Last Report: Recovery plan was completed and approved.
11. Major Activity Over Next Reporting Period: Continued protection of species and habitat via Section 7 consultation.
12. Recovery Achieved: 1
13. Information Current as of: July 25, 1990

Okaloosa darter 211

1. Species: Okaloosa darter (*Etheostoma okaloosae*)
2. Listing/Date: Endangered/June 4, 1973
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 11
6. Recovery Plan Title: Okaloosa Darter Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 23, 1981
9. Recovery Objective/Criteria: Downlist/Goal is to protect habitat and maintain and/or increase the population in accordance with the results of ongoing or proposed studies.
10. Major Activity Since Last Report: Ongoing study by FWS fisheries research to determine life history characteristics and extent of brown darter invasion.
11. Major Activity Over Next Reporting Period: Continuation of study.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

212 Slackwater darter

1. Species: Slackwater darter (*Etheostoma boschungi*)
2. Listing/Date: Threatened/September 9, 1977
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for the Slackwater Darter, *Etheostoma boschungi*
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/March 8, 1984
9. Recovery Objective/Criteria: Delist. Establishment and protection of one or more specific habitat areas in at least three different tributaries to the Tennessee River System in known spawning areas; data to indicate the populations are stable or increasing; and water quality and ecological data to indicate the environment is suitable and stable or improving.
10. Major Activity Since Last Report: No action.
11. Major Activity Over Next Reporting Period: Population status survey
12. Recovery Achieved: 1
13. Information Current as of: June 1990

213 Snail darter

1. Species: Snail darter (*Percina tanasi*)
2. Listing/Date: Threatened/July 5, 1984; Endangered/October 9, 1975
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 11
6. Recovery Plan Title: Snail Darter Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/May 5, 1983
9. Recovery Objective/Criteria: Delist. Establish five viable populations through the protection of the existing population and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: No recovery activities have been conducted on the species since completion of a status survey in 1982.
11. Major Activity Over Next Reporting Period: None planned.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Watercress darter

214

1. Species: Watercress darter (*Etheostoma nuchale*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Watercress Darter (*Etheostoma nuchale*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/June 25, 1980
9. Recovery Objective/Criteria: Downlist. Longterm protection of the 3 known populations; 5 years of data indicating the 3 currently known populations are stable or increasing in numbers; and establishment and long term protection of at least 1 additional population within or adjacent to the historical range.
10. Major Activity Since Last Report: Existing populations have been surveyed annually for past 5 years.
11. Major Activity Over Next Reporting Period: Survey of existing populations and two transplant sites.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Big Bend gambusia

215

1. Species: Big Bend gambusia (*Gambusia gaigei*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Big Bend Gambusia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 19, 1984
9. Recovery Objective/Criteria: Stabilize—Secure survival in a natural setting.
10. Major Activity Since Last Report: Maintained and monitored hatchery and refuge populations.
11. Major Activity Over Next Reporting Period: Continue maintenance and monitoring of refuge populations.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

216 Clear Creek gambusia

1. Species: Clear Creek gambusia (*Gambusia heterochir*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Clear Creek Gambusia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/January 14, 1982
9. Recovery Objective/Criteria: Downlist/Ultimate goal is to secure Clear Creek gambusia survival in its natural environment. Because of its extremely limited distribution and continuing threat from mosquitofish, delisting may not be possible.
10. Major Activity Since Last Report: Routine surveys of Wilkinson Springs.
11. Major Activity Over Next Reporting Period: Continued monitoring of fish and aquatic habitats that occur in upper Clear Creek.
12. Recovery Achieved: 2
13. Information Current as of: July 31, 1990

217 Pecos gambusia

1. Species: Pecos gambusia (*Gambusia nobilis*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan For Pecos Gambusia (*Gambusia nobilis*)
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/November 16, 1981
9. Recovery Objective/Criteria: Stabilize—Secure populations in four major areas of occurrence.
10. Major Activity Since Last Report: Annual monitoring of areas of occurrence.
11. Major Activity Over Next Reporting Period: Continue annual monitoring.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

San Marcos gambusia 218

1. Species: San Marcos gambusia (*Gambusia georgei*)
2. Listing/Date: Endangered/July 14, 1980
3. Group: Fishes
4. Species Status: Extinct (Possibly)
5. Recovery Priority: 2C
6. Recovery Plan Title: San Marcos Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: R/F/April 8, 1985
9. Recovery Objective/Criteria: Downlist/when flow in San Marcos River is assured. This objective and criteria will likely be modified in the revised Recovery Plan.
10. Major Activity Since Last Report: Two major searches have been conducted (one in May 1990, and one in July 1990) to find this species and begin a captive breeding program. No San Marcos gambusia were found, although one fish collected in the May search looked like it may have been a San Marcos gambusia hybrid.
11. Major Activity Over Next Reporting Period: Another major search is scheduled for September 1990.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

Pahrump killifish 219

1. Species: Pahrump killifish (*Empetrichthys latos*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for the Pahrump Killifish
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 17, 1980
9. Recovery Objective/Criteria: Downlisting—maintenance of 3 self-sustaining populations of at least 500 adult killifish (poolfish) in each population for at least 3 years, and all 3 habitats free of immediate and potential threats. Delisting—maintenance of at least the same 3 populations for at least another 3 years.
10. Major Activity Since Last Report: Annual status survey and population estimate for each population was conducted by Nevada Department of Wildlife personnel. Emergent vegetation (cattails) was treated with the herbicide "Rodeo" at the lower Corn Creek pond with no observed detrimental effects on poolfish numbers.
11. Major Activity Over Next Reporting Period: Continued annual census and population estimate.

The Pahrump killifish is improving in part due to successful reintroductions into springs in the Pahrump Valley of Nevada.

12. Recovery Achieved: 4
13. Information Current as of: July 25, 1990

220 Conasauga logperch

1. Species: Conasauga logperch (*Percina jenkinsi*)
2. Listing/Date: Endangered/August 5, 1985
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Conasauga Logperch and Amber Darter Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/June 20, 1986
9. Recovery Objective/Criteria: Stabilize. Maintain one population through the protection of the existing population.
10. Major Activity Since Last Report: A life history and threat analysis project is presently being conducted under a Section 6 project with the Tennessee Wildlife Resources Agency and Georgia Department of Natural Resources.
11. Major Activity Over Next Reporting Period: Current Section 6 project will end next year.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

221 Roanoke logperch

1. Species: Roanoke logperch (*Percina rex*)
2. Listing/Date: Endangered/August 18, 1989
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 5C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Species listed in 1989. A habitat suitability study is under way.
11. Major Activity Over Next Reporting Period: A recovery plan will be prepared. Development of habitat suitability curves will continue over the next 2 years. The re-charge area for the species' habitat will be determined.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Neosho madtom 222

1. Species: Neosho madtom (*Noturus placidus*)
2. Listing/Date: Threatened/May 22, 1990
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 11C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Conduct consultations on proposed watershed developments. Identify and analyze threats from non-native species and adverse effects of proposed watershed developments.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Scioto madtom 223

1. Species: Scioto madtom (*Noturus trautmani*)
2. Listing/Date: Endangered/September 25, 1975
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: Confirmation of the existence of the species.
10. Major Activity Since Last Report: None. The species is possibly extinct. Despite intensive sampling of its type locality and other apparently suitable habitat in nearby drainages during 1981-1985, no living specimens were located. The species was last collected in 1957.
11. Major Activity Over Next Reporting Period: None anticipated. Region 3 is unlikely to carry out or fund any recovery actions for this species until there is persuasive evidence that the species might exist.
12. Recovery Achieved: 1
13. Information Current as of: July 24, 1990

224

Smoky madtom

1. Species: Smoky madtom (*Noturus baileyi*)
2. Listing/Date: Endangered/October 26, 1984
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Smoky Madtom Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 9, 1985
9. Recovery Objective/Criteria: Delist. Establish four viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Reintroduced species into Abrams Creek, Monroe County, Tennessee. Propagation research is being conducted under a Section 6 project with the Tennessee Wildlife Resources Agency.
11. Major Activity Over Next Reporting Period: Continue propagation and reintroduction efforts.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

225

Yellowfin madtom

1. Species: Yellowfin madtom (*Noturus flavipinnis*)
2. Listing/Date: Threatened/September 9, 1977
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 11
6. Recovery Plan Title: Yellowfin Madtom Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/June 23, 1983
9. Recovery Objective/Criteria: Delist. Establish five viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Reintroduced species into Abrams Creek, Monroe County, Tennessee. Propagation research is being conducted at the Virginia Cooperative Fish and Wildlife Research Unit and under a Section 6 project with the Tennessee Wildlife Resources Agency.
11. Major Activity Over Next Reporting Period: Continue propagation and reintroduction efforts.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Loach minnow

226

1. Species: Loach minnow (*Tiaroga cobitis*)
2. Listing/Date: Threatened/October 28, 1986
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 4C
6. Recovery Plan Title: Loach Minnow Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: TA/July 27, 1988
9. Recovery Objective/Criteria: Delisting. Criteria to be developed as result of accomplishment of certain recovery plan actions.
10. Major Activity Since Last Report: A barrier to upstream non-native fish movement is being planned for Aravaipa Creek in Graham and Pinal Counties, Arizona. This barrier will be a multi-agency effort with primary funding and expertise being furnished by the Bureau of Reclamation under their new Enhancement Initiative. Surveys continue for loach minnow on the White Mountain Apache Indian Reservation. Evaluation of available habitat and modification needs for loach minnow reintroduction is being conducted on the San Pedro River in Cochise County, Arizona. Due to lack of funding from the Bureau of Land Management and the Fish and Wildlife Service, this work is proceeding slowly using volunteer efforts. Informal Section 7 consultation is in progress on proposed construction of a reservoir on Pigeon Creek, a tributary of the Blue River in Greenlee County, Arizona.
11. Major Activity Over Next Reporting Period: Aravaipa fish barrier, Section 7 protection, reintroduction habitat evaluation
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Ash Meadows Amargosa pupfish

227

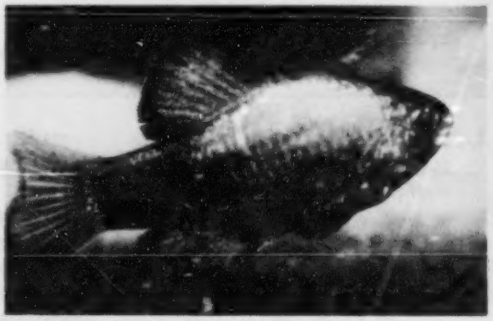
1. Species: Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionectes*)
2. Listing/Date: Endangered/September 2, 1983
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following 7 conditions should be met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish. Delisting—following criteria must be met for 5 years following downlisting: secure corridors for listed plant species within essential habitat; reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows speckled dace in addition to Ash Meadows Amargosa pupfish; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and 4 candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: (1) Initiation of multi-year research program by Seattle National Fisheries Center, utilizing Section 6 funding from the Nevada Dept. of Wildlife, to determine life history patterns of endemic fishes and aquatic invertebrates, and determine impacts of exotic species on endemic fishes and aquatic invertebrates. (2) Efforts (unsuccessful) to remove largemouth bass from large pool at Point-of-Rocks Spring.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September, 1990

228 Comanche Springs pupfish

1. Species: Comanche Springs pupfish (*Cyprinodon elegans*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Comanche Springs Pupfish (*Cyprinodon elegans*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 2, 1981
9. Recovery Objective/Criteria: Downlist—Ensure perpetuation in natural habitats and genetic diversity of all populations.
10. Major Activity Since Last Report: Initiation of Section 6 monitoring study and genetic analyses of recent hybridization problems with congener.
11. Major Activity Over Next Reporting Period: Continuation of above studies and acquisition of brood stock for establishment of hatchery/refuge population.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

229 Desert pupfish

1. Species: Desert pupfish (*Cyprinodon macularius*)
2. Listing/Date: Endangered/March 31, 1986.
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Under development
10. Major Activity Since Last Report: The first draft of a recovery plan for desert pupfish was completed under contract and is currently being reviewed by the recovery team. Stock of the Quitobaquito subspecies of desert pupfish is now being held at Arizona Game and Fish Department's Bubbling Ponds Fish Hatchery for refugium purposes. Stock of the nominate subspecies is being successfully maintained at Dexter NFH for refugium and reintroduction purposes. Desert pupfish were reintroduced into Cold Spring Seep on Bureau of Land Management land in Graham County, Arizona. Desert pupfish reintroduced populations were extirpated in at least one site in Arizona due to flooding (People Spring, Yavapai County, Arizona). Plans for construction of an upstream movement barrier against nonnative invading fishes is being planned for winter 1990-91 at the San Felipe Creek desert pupfish population (Imperial County, California). The streambed between the springhead and pond at Quitobaquito Spring on Organ Pipe National Monument was rebuilt to facilitate vegetation control. The springrun has been highly modified at several times in the past. Reconstruction was done with gunnite and was structured to imitate a natural system. Pupfish reoccupied the springrun within 2 weeks.
11. Major Activity Over Next Reporting Period: Recovery plan completion, Section 7 protection, reintroduction, monitoring, habitat protection and enhancement, captive propagation
12. Recovery Achieved: 1
13. Information Current as of: July 1990



The desert pupfish is an extremely hardy species capable of withstanding water temperatures in excess of 43° C (110° F) and salinities close to twice that of seawater. It is threatened due to its inability to compete with introduced species and the loss of its native habitat. Reintroduction of pupfish into native habitat is underway.

Devil's Hole pupfish 230

1. Species: Devil's Hole pupfish (*Cyprinodon diabolis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following 7 conditions met within essential habitat for a period of 5 years: Eradicate all non- native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish. Delisting—Devil's Hole pupfish is not delistable.
10. Major Activity Since Last Report: Population estimate conducted twice yearly; initiation of multiyear research program by Seattle National Fisheries Center, utilizing Section 6 funding from the Nevada Dept. of Wildlife, to determine life history patterns of endemic fishes and aquatic invertebrates, and determine impacts of exotic species on endemic fishes and aquatic invertebrates.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan; continue population monitoring.
12. Recovery Achieved: 2
13. Information Current as of: September, 1990

Leon Springs pupfish 231

1. Species: Leon Springs pupfish (*Cyprinodon bovinus*)
2. Listing/Date: Endangered/August 15, 1980
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Leon Springs Pupfish Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/August 14, 1985
9. Recovery Objective/Criteria: Stabilize—Secure survival.
10. Major Activity Since Last Report: Annual monitoring.
11. Major Activity Over Next Reporting Period: Annual monitoring.
12. Recovery Achieved: 2
13. Information Current as of: August 1990

232 Owens pupfish

1. Species: Owens pupfish (*Cyprinodon radiosus*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Owens Pupfish Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/1984
9. Recovery Objective/Criteria: Delist. Maintenance and enhancement of existing populations. Establishment of additional stable refugia and continued viability of these refugia for at least 5 years.
10. Major Activity Since Last Report: Additional refugia have been established. Attempts have been made to enhance existing habitat.
11. Major Activity Over Next Reporting Period: Protection of habitat at existing locations and monitoring of introduction sites. Additional refugia sites will be sought.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

233 Warm Springs pupfish

1. Species: Warm Springs pupfish (*Cyprinodon nevadensis pectoralis*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Rev/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following 7 conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish. Delisting—following criteria must be met for 5 years following downlisting: secure corridors for listed plant species within essential habitat; reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Ash Meadows Amargosa pupfish and Ash Meadows speckled dace in addition to Warm Springs pupfish; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and 4 candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Initiation of multi-year research program by Seattle National Fisheries Center, utilizing Section 6 funding from the Nevada Department of Wildlife, to determine life history patterns of endemic fishes and aquatic invertebrates, and determine impacts of exotic species on endemic fishes and aquatic invertebrates.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September 1990

Pygmy sculpin 234

1. Species: Pygmy sculpin (*Cottus pygmaeus*)
2. Listing/Date: Threatened/September 28, 1989
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 11
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: No action.
11. Major Activity Over Next Reporting Period: Population survey
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Beautiful shiner 235

1. Species: Beautiful shiner (*Cyprinella formosa*)
2. Listing/Date: Threatened/August 31, 1984
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Reintroduce to historic habitat in the United States.
10. Major Activity Since Last Report: Collection permits were obtained from the Mexican government for beautiful shiner. Approximately 900 shiners were collected in Mexico in October 1989 and brought back to Dexter National Fish Hatchery. 300 shiners were stocked in Twin pond at San Bernardino National Wildlife Refuge in May 1990.
11. Major Activity Over Next Reporting Period: Determine success of initial stocking and determine if shiners are spawning. If stocking is successful, introduce shiners into available habitat on the refuge. Initiate gathering of baseline genetic data.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

236 Cape Fear shiner

1. Species: Cape Fear shiner (*Notropis mekistocholas*)
2. Listing/Date: Endangered/September 25, 1987
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Cape Fear Shiner Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 7, 1988
9. Recovery Objective/Criteria: Delist. Establish six viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: No recovery activities have been conducted on the species since completion of a status survey in 1986.
11. Major Activity Over Next Reporting Period: North Carolina has submitted Cape Fear shiner Section 6 proposals for the past 2 years, but no funding has been available. They will likely submit another request this year; and if funds are available, a life history and threat analysis will likely be funded.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

237 Pecos bluntnose shiner

1. Species: Pecos bluntnose shiner (*Notropis simus pecosensis*)
2. Listing/Date: Threatened/February 19, 1987
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: Pecos Bluntnose Shiner Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: TA
9. Recovery Objective/Criteria: Stabilize—Secure in remaining occupied areas and reintroduce into unoccupied historic habitat.
10. Major Activity Since Last Report: Initiation of inventories to determine seasonal distribution and abundance relative to reservoir operations.
11. Major Activity Over Next Reporting Period: Continuation of inventories and initiation of detailed life history studies.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Waccamaw silverside 238

1. Species: Waccamaw silverside (*Menidia extensa*)
2. Listing/Date: Threatened/April 8, 1987
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Worked with local municipality and lakefront landowners on a weed control plan that would not be detrimental to the ichthyofauna of the lake; commented on several development proposals to minimize impacts to the fish's habitat.
11. Major Activity Over Next Reporting Period: Not yet planned
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Spikedace 239

1. Species: Spikedace (*Meda fulgida*)
2. Listing/Date: Threatened/July 1, 1986
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 4C
6. Recovery Plan Title: Spikedace Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: TA/July 27, 1988
9. Recovery Objective/Criteria: Delisting. Criteria to be developed as result of accomplishment of certain recovery plan actions.
10. Major Activity Since Last Report: Formal Section 7 consultation on the Bureau of Reclamation's Central Arizona Project/Upstream Verde River Water Exchanges was completed in May. The biological opinion found the proposed project to be likely to jeopardize the continued existence of the spikedace and likely to adversely modify its proposed critical habitat. Additional Section 7 issues are expected on the upper Verde River spikedace population (Yavapai County, Arizona) as a result of the proposed Ft. McDowell Indian Water Rights Settlement bill which is being considered by Congress. This bill would involve pumping of groundwater from the uppermost Verde River basin and downstream transport of some of that water via the river channel. A barrier to upstream movement of non-native fishes is being planned for Aravaipa Creek in Graham and Pinal Counties, Arizona. This barrier will be a multi-agency effort with primary funding and expertise being furnished by the Bureau of Reclamation under their new Enhancement Initiative. Evaluation of available habitat and modification needs for loach minnow reintroduction are being conducted on the San Pedro River in Cochise County, Arizona. Due to lack of funding from the Bureau of Land Management and the Fish and Wildlife Service, this work is proceeding slowly using volunteer efforts.
11. Major Activity Over Next Reporting Period: Initiate Aravaipa fish barrier, Section 7 protection, reintroduction habitat evaluation
12. Recovery Achieved: 1
13. Information Current as of: July 1990

240 Big Spring spinedace

1. Species: Big Spring spinedace (*Lepidomeda mollispinis pratensis*)
2. Listing/Date: Threatened/March 28, 1985
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 12
6. Recovery Plan Title: Big Spring Spinedace Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: TA/July 30, 1986
9. Recovery Objective/Criteria: Secure Condor Canyon population, establish a second population within the Meadow Valley Wash drainage.
10. Major Activity Since Last Report: Initiation of life history study and transplant site identification site study using Section 6 funds.
11. Major Activity Over Next Reporting Period: Continuation of life history and transplant site studies.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

241 Little Colorado spinedace

1. Species: Little Colorado spinedace (*Lepidomeda vittata*)
2. Listing/Date: Threatened/September 16, 1987
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Delist/criteria for delisting not yet established.
10. Major Activity Since Last Report: Recovery team formed. Broad objectives addressed. Recovery plan preparation initiated.
11. Major Activity Over Next Reporting Period: Complete Recovery plan. Articulate recovery objectives and tasks. Initiate field activities for recovering the species.
12. Recovery Achieved: 1
13. Information Current as of: July 31, 1990

White River spinedace 242

1. Species: White River spinedace (*Lepidomeda albivallis*)
2. Listing/Date: Endangered/ September 12, 1985
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: Recovery Plan for the White River Spinedace
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/Draft/March 1988
9. Recovery Objective/Criteria: Establishment of four native populations and one refugium population. Each native population should consist of at least 500 adults and the refugium population at least 200 adults, for a minimum of 5 years.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Recovery plan to be finalized.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Hiko White River springfish 243

1. Species: Hiko White River springfish (*Crenichthys baileyi grandis*)
2. Listing/Date: Endangered/ September 27, 1985
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 3C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed (probably will include at least one refugium population in addition to those in natural habitat)
10. Major Activity Since Last Report: Annual census conducted at Hiko and Crystal Springs. Census in May, 1987 of Blue Link Spring refugium population found more than 5,000 individuals, but population thought to be very low presently due to cold water temperatures.
11. Major Activity Over Next Reporting Period: Continue censusing at the three sites using Section 6 money (Nevada Dept. of Wildlife), maintain Blue Link Spring refugium, continue electrophoresis analysis.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

244 Railroad Valley springfish

1. Species: Railroad Valley springfish (*Crenichthys nevadae*)
2. Listing/Date: Threatened/March 31, 1986
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 2C
6. Recovery Plan Title: Recovery Plan for the Railroad Valley Springfish
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/Partial draft
9. Recovery Objective/Criteria: Secure native habitats, establish at least one refugium population for each of the two native populations.
10. Major Activity Since Last Report: Population estimates completed in 1989 at 4 Lockes Ranch springs. Springs in the Duckwater area (type locality), and all introduced populations were checked and estimates made of abundance.
11. Major Activity Over Next Reporting Period: Inventory and monitor populations at native localities and introduced sites (Nevada Department of Wildlife, using Section 6 money). Continue work on Recovery Plan.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

245 White River springfish

1. Species: White River springfish (*Crenichthys baileyi baileyi*)
2. Listing/Date: Endangered/September 27, 1985
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 3C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Completion of research project by Service's Seattle Research Lab on Pahranagat River Fishes. Includes information on springfish seasonal distribution, abundance, and habitat use.
11. Major Activity Over Next Reporting Period: Nevada Department of Wildlife, using Section 6 money, will continue to monitor population level, control exotic species, and evaluate potential for development of refugium population.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Colorado squawfish 246

Species: Colorado squawfish (*Ptychocheilus lucius*)

Listing/Date: Endangered/March 11, 1967

Group: Fishes

Species Status: Stable

Recovery Priority: 2C

Recovery Plan Title: Colorado Squawfish Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 6

Recovery Plan Stage/Date: R/F/March 16, 1978

Recovery Objective/Criteria: Downlist—when self-sustaining populations are maintained in three reaches of tributaries in the Green River Basin and a portion of the Colorado River (in addition, the inclusion of appropriate habitat newly identified in the San Juan River is being considered). Delist—in addition, reestablish a population in the Salt or Verde River and protect essential habitats, migratory routes and stream-flows, and remove the threat of population fragmentation.

10. Major Activity Since Last Report: The "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" entered its third year and a $2.8 million work plan covering 44 high priority recovery activities was developed by the Upper Basin Recovery Program Implementation Committee for FY 90. The Colorado Squawfish Recovery Plan underwent agency and public review. The Service is refining recommendations for flow needed to maintain species' habitat and has begun investigations to acquire needed water rights. Restocking from hatchery-bred fish has been successful and an experimental population is being established in the Salt and Verde Rivers.

11. Major Activity Over Next Reporting Period: A genetics diversity study will begin in FY 91. Work will continue to investigate water rights acquisition and in development and implementation of FY 91 recovery work plan.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

Unarmored threespine stickleback 247

Species: Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*)

Listing/Date: Endangered/ October 13, 1970

Group: Fishes

Species Status: Stable

Recovery Priority: 3

Recovery Plan Title: Recovery Plan for the Unarmored Threespine Stickleback

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: Rev/F/June 1982

Recovery Objective/Criteria: Maintain five self-sustaining populations that have no significant threat to their continued existence.

10. Major Activity Since Last Report: Capturing and controlling expanding populations of the African clawed frog, a major predator of this species, in Soledad Canyon.

11. Major Activity Over Next Reporting Period: Continue predator control efforts.

12. Recovery Achieved: 1

13. Information Current as of: August 1990

248 Pallid sturgeon

1. Species: Pallid sturgeon (*Scaphirhynchus albus*)
2. Listing/Date: Endangered/September 6, 1990
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Prepare draft recovery plan. Consider habitat acquisition and investigate water rights acquisition. Develop Section 6 agreements. Undertake research on status, distribution, artificial propagation, reintroduction techniques, and habitat utilization. Educate public on the distinguishing characteristics of this species from the more abundant shovelnose sturgeon.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

249 June sucker

1. Species: June sucker (*Chasmistes liorus*)
2. Listing/Date: Endangered/March 31, 1986
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Artificial propagation is continuing at Utah Cooperative Fish and Wildlife Research Unit with the propagation of spawn taken from wild adult fish to supplement existing brood and refugium populations. Additional year classes have been added to the brood stock in 1988 and 1989. No eggs were found in 1990.
11. Major Activity Over Next Reporting Period: Artificial propagation will continue. Efforts will be undertaken to establish refugia for this species. Inventories will be conducted to identify potential reintroduction areas to safeguard against potential catastrophe in the Provo River and Utah Lake, where the population is severely threatened and reproductive recruitment is low due to high populations of non-native predatory fish.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Lost River sucker 250

1. Species: Lost River sucker (*Deltistes luxatus*)
2. Listing/Date: Endangered/July 18, 1988
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 1
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Establish pure, self-sustaining populations in the Klamath Basin.
10. Major Activity Since Last Report: Initiation of genetic analysis, monitoring of Upper Klamath Lake water quality, and initiation of habitat restoration studies, under direction of Klamath Basin Sucker Working Group
11. Major Activity Over Next Reporting Period: Prepare recovery plan and continue activities outlined in #10.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Modoc sucker 251

1. Species: Modoc sucker (*Catostomus microps*)
2. Listing/Date: Endangered/June 11, 1985
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: Secure habitat and establish viable Modoc sucker populations throughout the Turner-Hulber-Washington Creeks drainage basin and at least two other drainages within the historic range.
10. Major Activity Since Last Report: Salvage of fishes affected by dessication of streams during fourth year of drought. Initiation of genetic analysis to determine pure populations for reintroduction to historic habitat.
11. Major Activity Over Next Reporting Period: Complete revision of 1984 Interagency Action Plan for Recovery of the Modoc Sucker, restore habitat, and continue actions outlined in No. 10.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

252 Short-nose sucker

1. Species: Short-nose sucker (*Chasmistes brevirostris*)
2. Listing/Date: Endangered/July 18, 1988
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Establish pure, self-sustaining populations in the Klamath Basin.
10. Major Activity Since Last Report: Initiation of genetic analysis, monitoring of Upper Klamath Lake water quality, and initiation of habitat restoration studies under the direction of Klamath Basin Sucker Working Group.
11. Major Activity Over Next Reporting Period: Prepare recovery plan and continue activities in #10.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

253 Warner sucker

1. Species: Warner sucker (*Catostomus warnerensis*)
2. Listing/Date: Threatened/September 27, 1985
3. Group: Fishes
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Warner Sucker Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: TA
9. Recovery Objective/Criteria: Eliminate threats to remaining populations of Warner suckers, and restore the species throughout historic habitats in the Twentymile, Deep, and Honey Creek drainages, and in Hart Lake. Populations must be naturally reproducing throughout historic range, streams must be free of exotic fishes, and there must be free passage past existing agricultural diversion structures without high mortality of adults and juveniles.
10. Major Activity Since Last Report: Inventory of lake and pothole areas.
11. Major Activity Over Next Reporting Period: Continue to inventory lakes and extend to stream habitats. Install fish ladder at 20 mile diversion dike. Examine potential for establishing rearing ponds.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Gila topminnow 254

1. Species: Gila topminnow (incl. Yaqui) (*Poeciliopsis occidentalis*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Sonoran Topminnow (Gila and Yaqui) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: R/F/March 15, 1984
9. Recovery Objective/Criteria: Under revision
10. Major Activity Since Last Report: In FY90, at least two Gila topminnow reintroduced populations failed due to various factors (Peoples Canyon and Castle Creek, both in Yavapai Co., AZ. Gila topminnow stock from Bos and Medicine Springs at Bylas Springs complex (Gila County, Arizona) is now being held at Arizona State Univ. pending chemical removal of mosquitofish from the habitat. Barrier repair at Bylas Springs was completed and mosquitofish removal may take place in FY 91, depending upon funding. Limited monitoring of natural populations was conducted by Arizona Game and Fish Department using Section 6 funds. Intensive monitoring of the Cienega Creek population in Pima County, Arizona, is being conducted by volunteer biologists. Formal Section 7 consultation has just been initiated by the Forest Service on proposed grazing use changes, road closure, and other watershed improvement actions at Redrock Canyon in Santa Cruz County, Arizona. Stock is being successfully maintained at Dexter National Fish Hatchery for refugium and reintroduction purposes.
11. Major Activity Over Next Reporting Period: Section 7 protection, monitoring, habitat protection and enhancement, studies, reintroduction, mosquitofish and other exotic fish removal, captive propagation
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Apache trout 255

1. Species: Apache (= Arizona) trout (*Oncorhynchus apache*)
2. Listing/Date: Threatened/March 11, 1987; July 16, 1975
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Arizona Trout Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 15, 1983
9. Recovery Objective/Criteria: Delist/Action to occur when 30 self-sustaining populations have been established in the species' historic habitat.
10. Major Activity Since Last Report: Barrier constructed on Little Bonita Creek. Electrophoretic work completed
11. Major Activity Over Next Reporting Period: Renovate at least three streams and restock with pure Apache trout stocks. Complete electrophoretic work on all existing wild Apache trout populations.
12. Recovery Achieved: 2
13. Information Current as of: July 31, 1990

256

Gila trout

1. Species: Gila trout (*Oncorhynchus (=Salmo) gilae*)
2. Listing/Date: Endangered/March 11, 1967
3. Group: Fishes
4. Species Status: Declining, primarily due to drought and associated forest fires
5. Recovery Priority: 2
6. Recovery Plan Title: Gila Trout Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/January 3, 1984
9. Recovery Objective/Criteria: Downlisting is the short-term goal, delisting is the long-term goal. Of immediate concern is to secure survival of all wild populations. Duplicating and triplicating stocks in streams within the historic habitat to protect remaining genome.
10. Major Activity Since Last Report: Surveyed several streams, West Fork of the Gila, Cub, White, South Diamond, Main Diamond and transferred fish from Iron to Sacaton Creek. Revised Recovery Plan.
11. Major Activity Over Next Reporting Period: Continue surveys and reintroduction of fish into South Diamond and Main Diamond as appropriate.
12. Recovery Achieved: 2
13. Information Current as of: July 31, 1990

257

Greenback cutthroat trout

1. Species: Greenback cutthroat trout (*Oncorhynchus clarki stomias*)
2. Listing/Date: Threatened/April 18, 1978
3. Group: Fishes
4. Species Status: Improving
5. Recovery Priority: 15
6. Recovery Plan Title: Greenback Cutthroat Trout Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: R/Rev/September 30, 1983; F/November 11, 1977
9. Recovery Objective/Criteria: Delist—when 20 stable populations are documented and maintained within the species' native range.
10. Major Activity Since Last Report: Stocking of greenbacks in Rocky Mountain National Park lakes was conducted in 1989. Some populations in Rocky Mountain National Park were opened to catch-and-release angling. A new captive brood stock is being established at the Colorado Division of Wildlife's Experimental Hatchery. Trout Unlimited and Texaco, Inc. have provided funds to assist in recovery efforts. Inadequate funding has prevented accomplishment of habitat restoration projects outside Rocky Mountain National Park.
11. Major Activity Over Next Reporting Period: Waters in the Arkansas River drainage are being investigated for future reintroduction potential. The Service is evaluating how close we are to meeting recovery goals for this species.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Lahontan cutthroat trout 258

1. Species: Lahontan cutthroat trout (*Oncorhyncus clarki henshawi*)
2. Listing/Date: Endangered/ October 13, 1970, Threatened/ July 16, 1975
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Lahontan Cutthroat Trout Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A
9. Recovery Objective/Criteria: No quantitative criteria established. Draft plan provides for development of a management plan for each sub-basin, and delisting by sub-basin once identified objectives are reached.
10. Major Activity Since Last Report: Continuation of stream surveys and fish inventories by Nevada Department of Wildlife, Bureau of Land Management (BLM), and Forest Service (FS). Development of some Habitat Management Plans/Allotment Management Plans by BLM and FS.
11. Major Activity Over Next Reporting Period: 1) Attempt by Reno Field Station to secure funding/personnel to rewrite and finalize Recovery Plan. 2) Development by Nevada Department of Wildlife of draft management plan for Quinn River sub-basin. 3) Continuation of stream surveys and fish inventories. 4) Issuance of several grazing decisions/Allotment Management Plans by BLM and FS.
12. Recovery Achieved: 1
13. Information Current as of: July 25, 1990

Little Kern golden trout 259

1. Species: Little Kern golden trout (*Oncorhynchus aguabonita whitei*)
2. Listing/Date: Threatened/April 13, 1978
3. Group: Fishes
4. Species Status: Stable
5. Recovery Priority: 9C
6. Recovery Plan Title: N/A (Revised Fisheries Management Plan by California being used in lieu of)
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: N/A
9. Recovery Objective/Criteria: Complete genetic analysis of all populations, chemically treat all streams that contain hybrid or exotic trout, and establish stable, self-sustaining populations within designated Critical Habitat. These objectives are outlined in The Revised Fishery Management Plan for the Little Kern Golden Trout (Christenson 1984).
10. Major Activity Since Last Report: Chemical treatment of Silver Lake, Lower Shotgun Creek, Pistol Creek, and Trout Meadows Creek.
11. Major Activity Over Next Reporting Period: Complete chemical treatment of nine additional waters.
12. Recovery Achieved: 2
13. Information Current as of: August 23, 1990

260 Paiute cutthroat trout

1. Species: Paiute cutthroat trout (*Oncorhynchus clarki seleniris*)
2. Listing/Date: Threatened/July 16, 1975
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Paiute Cutthroat Trout Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 25, 1985
9. Recovery Objective/Criteria: Delist when a population size of at least 500 individuals is maintained.
10. Major Activity Since Last Report: U.S. Forest Service has conducted habitat restoration projects, with cooperation of Trout Unlimited, in the mainstem of Silver King Creek. California Department of Fish and Game has applied rotenone to remove undesirable fish. These applications were not effective.
11. Major Activity Over Next Reporting Period: California Department of Fish and Game will retreat the mainstem of Silver King Creek with rotenone.
12. Recovery Achieved: 1
13. Information Current as of: July 20, 1990

261 Woundfin

1. Species: Woundfin (*Plagopterus argentissimus*)
2. Listing/Date: Endangered/October 13, 1970
3. Group: Fishes
4. Species Status: Declining
5. Recovery Priority: 1C
6. Recovery Plan Title: Woundfin Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: R/Rev/March 1, 1985; F/July 9, 1979
9. Recovery Objective/Criteria: Stabilize—upgrade and stabilize existing and marginal habitats in the Virgin River, maintain present populations, and establish one additional population in a different drainage within historical range. Delist—establish a third self-sustaining population in a separate drainage within the historic range. All populations must be self-sustaining with population numbers over 100,000 for at least 10 years.
10. Major Activity Since Last Report: A program was conducted in 1989 to eradicate the non-native red shiner (which outcompetes the woundfin) from a 21-mile reach of the Virgin River. A 6-mile reach was successful and the area in now available for reintroduction of the woundfin. Further treatments are planned to complete red shiner eradication and make additional river habitat available for species reintroduction.
11. Major Activity Over Next Reporting Period: Eradication of the red shiner will continue, as will reintroduction of the woundfin into available quality habitat. Efforts to develop successful propagation techniques will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Appendix IV. Invertebrates

Magazine Mountain shagreen

262

1. Species: Magazine Mountain shagreen (*Mesodon magazinensis*)
2. Listing/Date: Threatened/April 17, 1989
3. Group: Snails
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: No action taken.
11. Major Activity Over Next Reporting Period: Initiate draft recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Chittenango ovate amber snail

263

1. Species: Chittenango ovate amber snail (*Succinea chittenangoensis*)
2. Listing/Date: Threatened/July 28, 1978
3. Group: Snails
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Chittenango Ovate Amber Snail Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/March 24, 1983
9. Recovery Objective/Criteria: Stabilize/Protect and ensure the maintenance of the self-sustaining colony at Chittenango Falls. Delisting will be considered if 5 additional populations are found.
10. Major Activity Since Last Report: Population monitoring, habitat monitoring, and habitat protection. No increase has been seen in the one known population. An increasing number of introduced succineids continues to be a concern.
11. Major Activity Over Next Reporting Period: Monitoring and habitat protection will continue. Efforts to create and maintain a captive population will be undertaken.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

264 Flat-spired three-toothed land snail

1. Species: Flat-spired three-toothed land snail (*Triodopsis platysayoides*)
2. Listing/Date: Threatened/July 28, 1978
3. Group: Snails
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Flat-Spired Three-Toothed Snail (*Triodopsis platysayoides*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/May 9, 1983
9. Recovery Objective/Criteria: Delist when species is found at a minimum of 3 additional discrete sites, 60% of sites are protected, there is a management and monitoring plan in place, and monitoring shows no downward trend.
10. Major Activity Since Last Report: Monitoring and habitat protection. Studies to determine total distribution. Six new sites were located in the Coopers Rock area on both sides of the Cheat River Gorge.
11. Major Activity Over Next Reporting Period: Monitoring of known populations and searches for new populations.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

265 Iowa Pleistocene snail

1. Species: Iowa Pleistocene snail (*Discus macclintocki*)
2. Listing/Date: Endangered/July 3, 1978
3. Group: Snails
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: National Recovery Plan for the Iowa Pleistocene Snail
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/March 22, 1984
9. Recovery Objective/Criteria: Delisting. Criteria as follows: Downlisting: permanent protection and documentation of stable or increasing populations at 16 colonies. Delisting: similar protection and status documented for 24 sufficiently dispersed, viable colonies. (A viable colony is assumed to have an effective breeding population of at least 500 individuals.)
10. Major Activity Since Last Report: Population monitoring methods are being tested on other snail species found in the same habitats. Over 230 acres (for approximately $170,000) have been purchased as part of the Service's Algific Talus Slope Land Acquisition Program for habitat protection for the northern monkshood and this species. Management plans are being prepared for these new refuge units. A number of state- and The Nature Conservancy-owned sites have been fenced (Section 6 funding) to eliminate site degradation from grazing.
11. Major Activity Over Next Reporting Period: Acquisition of additional sites by the Service is expected. Approximately $300,000 remains in the acquisition account. Acquired sites will be protected from habitat degradation, and population monitoring methods will be developed and implemented.
12. Recovery Achieved: 2
13. Information Current as of: July 23, 1990

Noonday snail

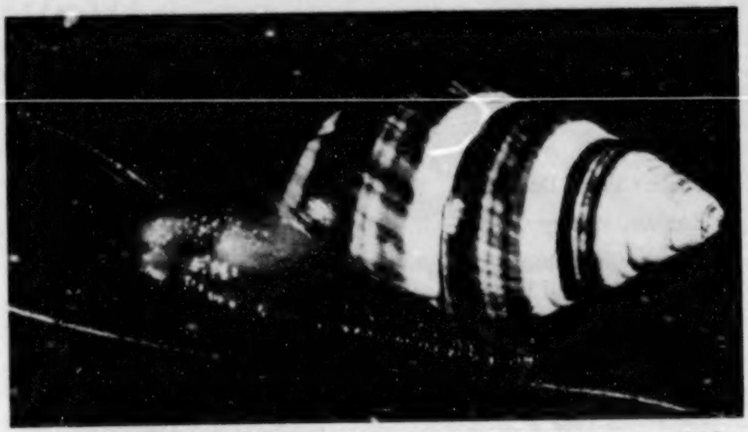
266

1. Species: Noonday snail (*Mesodon clarki nantahala*)
2. Listing/Date: Threatened/July 3, 1978
3. Group: Snails
4. Species Status: Unknown
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan For The Noonday Snail (*Mesodon clarki nantahala*)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 7, 1984
9. Recovery Objective/Criteria: To delist the species by protecting the known population from adverse human activities and determining, by 5 years of continuous monitoring, that the population is stable; or, discovering sufficient additional populations of the species to insure that the species will continue to exists without the protection offered by the Act.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

Oahu tree snail

267

1. Species: Oahu tree snail (*Achatinella* 19 species)
2. Listing/Date: Endangered/August 6, 1981
3. Group: Snails
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Oahu Tree Snails Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Continue work on development of recovery plan.



The loss of native trees on the island of Oahu, Hawaii is believed to have prompted the decline in these endemic tree snails. With the loss of native trees, the snails' shelter and food sources have disappeared. Collectors also pose a threat.

12. Recovery Achieved: 1
13. Information Current as of: August 1990

268 Painted snake coiled forest snail

1. Species: Painted snake coiled forest snail (*Anguispira picta*)
2. Listing/Date: Threatened/July 3, 1978
3. Group: Snails
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Painted Snake Coiled Forest Snail Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 14, 1990
9. Recovery Objective/Criteria: To delist the species by protecting the known population from adverse human activities and determining, by 5 years of continuous monitoring, that the population is stable; or, discovering sufficient additional populations of the species to insure that the species will continue to exist without the protection offered by the Act.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

269 Stock Island tree snail

1. Species: Stock Island tree snail (*Orthalicus reses reses*)
2. Listing/Date: Threatened/July 3, 1978
3. Group: Snails
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Recovery Plan Stock Island Tree Snail.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/March 9, 1983
9. Recovery Objective/Criteria: Delist/Species can be delisted when the following criteria are met: Species is present throughout a minimum of 20 acres of habitat. Population shows no consistent downward trend for more than 2 consecutive years. Management agreements in place with involved agencies. Minimum of 30 additional populations have been reestablished.
10. Major Activity Since Last Report: None to report.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Virginia fringed mountain snail 270

1. Species: Virginia fringed mountain snail (*Polygyriscus virginianus*)
2. Listing/Date: Endangered/July 3, 1978
3. Group: Snails
4. Species Status: Stable
5. Recovery Priority: 4
6. Recovery Plan Title: Virginia Fringed Mountain Snail (*Polygyris virginianus*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/May 9, 1983
9. Recovery Objective/Criteria: Delist/ All habitats protected, long-term management and monitoring programs implemented, and no downward trend in habitat quality and distribution. Stabilization now appears to be a more realistic objective.
10. Major Activity Since Last Report: Habitat monitoring.
11. Major Activity Over Next Reporting Period: Habitat acquisition. Development of sampling method to determine distribution of live snails.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Fanshell 271

1. Species: Fanshell (*Cyprogenia stegaria (= irrorata)*)
2. Listing/Date: Endangered/June 21, 1990
3. Group: Mussels
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act. Conducted mussel propagation research and a mussel survey of the Tennessee, Clinch, and Green Rivers.
11. Major Activity Over Next Reporting Period: Continuation of the mussel propagation research. Conduct additional mussel surveys in the Tennessee, Clinch, and Green Rivers. Develop an educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Investigate the life history of the species in the Green River.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

272

Arkansas fatmucket

1. Species: Arkansas fatmucket (*Lampsilis powelli*)
2. Listing/Date: Threatened/April 5, 1990
3. Group: Clams
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Known range on U.S. Forest Service lands was surveyed to establish population trends.
11. Major Activity Over Next Reporting Period: U.S. Forest Service plans to conduct some habitat studies.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

273

Inflated heelsplitter

1. Species: Inflated heelsplitter (*Potamilus inflatus*)
2. Listing/Date: Threatened/September 28, 1990
3. Group: Mussels
4. Species Status: Declining
5. Recovery Priority: 8C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: To survey populations in the Tombigbee and Black Warrior River systems.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Curtus' mussel 274

1. Species: Curtus' mussel (*Pleurobema curtum*)
2. Listing/Date: Endangered/April 7, 1987
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Five Tombigbee River Mussels Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 14, 1989
9. Recovery Objective/Criteria: Prevent extinction and protect the remaining range of the species.
10. Major Activity Since Last Report: Search and assessment of habitat in East Fork Tombigbee River and Tombigbee River at Gainesville Bendway (FY 88). No indication of species was found. Habitat decline due to siltation was noted at both sites. Shell survey in East Fork habitat resulted in recovery of four fresh dead specimens (FY 89). East Fork shell survey in FY 90 resulted in recovery of one fresh dead specimen.
11. Major Activity Over Next Reporting Period: Work with Ecological Services and Corps of Engineers to establish minimum flows through Gainesville Bendway. Continue to monitor East Fork population and habitat.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Dwarf wedge mussel 275

1. Species: Dwarf wedge mussel (*Alasmidonta heterodon*)
2. Listing/Date: Endangered/March 14, 1990
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Various studies are underway, including determination of host fishes, contaminant studies, and population trend studies. Population surveys have resulted in the location of two new populations in Virginia and New York; however, the New England populations are declining. Habitat protection is being initiated through landowner contacts.
11. Major Activity Over Next Reporting Period: The host fish study will be completed, more surveys to determine total distribution of the species and population trends throughout its range will be undertaken, and a recovery plan will be prepared.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

276 Judge Tait's mussel

1. Species: Judge Tait's mussel (*Pleurobema taitianum*)
2. Listing/Date: Endangered/April 7, 1987
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Five Tombigbee River Mussels Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 14, 1989
9. Recovery Objective/Criteria: Prevent extinction and protect the remaining range of the species.
10. Major Activity Since Last Report: A status survey and habitat assessment of the East Fork Tombigee River (FY 88), Gainesville Bendway (FY 88) and the lower Buttahatchee River (FY 89) has been completed. The species was not found in the East Fork Tombigbee, and the habitat has been severely impacted by siltation and drought. The species was not found in the Gainesville Bendway, and the habitat was impacted by Tennessee Tombigbee Waterway releases and siltation. The population in the extreme lower Buttahatchee was not encountered, and habitat has been impacted by gravel mines and siltation. Shell surveys of the East Fork during FY 89 and 90 did not encounter the species.
11. Major Activity Over Next Reporting Period: Status surveys and habitat assessment of the remaining Buttahatchee habitat, and of the Sipsey River will be continued.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

277 Marshall's mussel

1. Species: Marshall's mussel (*Pleurobema marshalli*)
2. Listing/Date: Endangered/April 7, 1987
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Five Tombigbee River Mussels Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 14, 1989
9. Recovery Objective/Criteria: Prevent extinction and protect the remaining range of the species.
10. Major Activity Since Last Report: Survey and habitat assessment of the Tombigbee River at Gainesville Bendway, AL (FY 88). No Marshall's mussel shells were found. This historic population site has been affected by the construction of the Tennessee Tombigbee Waterway. The lower reaches of the Bendway are heavily silted.
11. Major Activity Over Next Reporting Period: Work with Ecological Services and Corps of Engineers to establish minimum flows through Gainesville Bendway.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Penitent mussel 278

1. Species: Penitent mussel (*Epioblasma* (=*Dysnomia*) *penita*)
2. Listing/Date: Endangered/April 7, 1987
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Five Tombigbee Mussels Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 14, 1989
9. Recovery Objective/Criteria: Prevent extinction and protect the remaining range of the species.
10. Major Activity Since Last Report: A status survey and habitat assessment of the East Fork Tombigbee River (FY 88) and the lower Buttahatchee River (FY 89) has been completed. The species was not found in the East Fork Tombigbee, and the habitat has been severely impacted by siltation and drought. The population in the extreme lower Buttahatchee has declined from historic levels, and habitat has been impacted by gravel mines and siltation. Shell surveys of the East Fork during FY 89 and 90 did not find the species.
11. Major Activity Over Next Reporting Period: Status surveys and habitat assessment of the remaining Buttahatchee habitat, and of the Sipsey River, will be continued.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Ring pink mussel 279

1. Species: Ring pink (=golf stick pearly) mussel (*Obovaria retusa*)
2. Listing/Date: Endangered/September 29, 1989
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Ring Pink Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: T/March 1990
9. Recovery Objective/Criteria: Delist. Establish 9 viable populations through the protection of existing populations and through discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel survey of the Tennessee and Green Rivers.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Additional mussel surveys in the Tennessee and Green River. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Investigate life history of the species in the Green River.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

280

Louisiana pearlshell

1. Species: Louisiana pearlshell (*Margaritifera hembeli*)
2. Listing/Date: Endangered/February 5, 1988
3. Group: Clams
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for the Louisiana Pearlshell (*Margaritifera hembeli*)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/undated
9. Recovery Objective/Criteria: Downlist. Populations in each of Long Branch, Bayou Clear, Loving Creek and Little Loving Creek number the greater of 2,000 individuals or the level determined by the Louisiana Natural Heritage Program survey of 1985, and the habitat in these streams is fully protected; populations in each of Mack Branch, Castor Creek, and Brown Creek number in excess of 1,000 individuals, and the habitat is fully protected; and these minimum levels are maintained for a period of at least 10 years with evidence of successful reproduction and recruitment.
10. Major Activity Since Last Report: No action.
11. Major Activity Over Next Reporting Period: All streams will be surveyed to determine population status.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

281

Alabama lamp pearly mussel

1. Species: Alabama lamp pearly mussel (*Lampsilis virescens*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: A Recovery Plan for the Alabama Lamp Pearly Mussel Lampsilis virescens (Lea 1858)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 2, 1985
9. Recovery Objective/Criteria: Delist. Locate or establish a viable population in the Paint Rock River above Wheeler Reservoir influence. Locate or establish viable populations in two additional streams within historic range. Protect historic, newly discovered, and established species populations.
10. Major Activity Since Last Report: No action taken.
11. Major Activity Over Next Reporting Period: Determine the species' current status, distribution and habitat requirements in the Paint Rock River System.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Appalachian monkeyface pearly mussel

282

1. Species: Appalachian monkeyface pearly mussel (*Quadrula sparsa*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Appalachian Monkeyface Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 9, 1984
9. Recovery Objective/Criteria: Delist. Establish three viable populations through the protection of existing populations and through the discovery and/or creation of an additional population.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels in the Powell River. Mussel propagation research. Mussel survey of the Powell and Clinch Rivers.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of the toxic components of coal waste to mussels. Additional mussel surveys in the Clinch and Powell Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Birdwing pearly mussel

283

1. Species: Birdwing pearly mussel (*Conradilla caelata*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 4C
6. Recovery Plan Title: Birdwing Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 9, 1984
9. Recovery Objective/Criteria: Delist. Establish five viable populations through the protection of existing populations and discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels in the Powell River. Mussel propagation research. Mussel survey of the Powell, Clinch, Duck, and Elk Rivers.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of the toxic components of coal waste to mussels. Additional mussel surveys in the Powell, Clinch, Duck, and Elk Rivers. Evaluate birdwing pearly mussel transplants. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

284 Cracking pearly mussel

1. Species: Cracking pearly mussel (*Hemistena lata*)
2. Listing/Date: Endangered/September 28, 1989
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 4
6. Recovery Plan Title: Cracking Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: T/July 1990
9. Recovery Objective/Criteria: Delist. Establish eight viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel survey of the Clinch, Powell, Elk, Tennessee, and Green Rivers. Study of the impacts of coal related silt and toxic components of coal waste on mussels.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research and study of the impacts of coal related silt and toxic components of coal waste on mussels. Additional mussel surveys in the Clinch, Powell, Tennessee, and Green Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

285 Cumberland bean pearly mussel

1. Species: Cumberland bean pearly mussel (*Villosa trabalis*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Cumberland Bean Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 22, 1984
9. Recovery Objective/Criteria: Delist. Establish five viable populations through the protection of existing populations and through discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels. Mussel propagation research. Mussel survey of the Cumberland River system. Evaluation of mussel instream flow needs. Determination of fish hosts.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of coal waste to mussels. Additional mussel surveys in the Cumberland River system. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Continuation of instream flow needs study.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Cumberland monkeyface pearly mussel 286

1. Species: Cumberland monkeyface pearly mussel (*Quadrula intermedia*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Cumberland Monkeyface Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 9, 1984
9. Recovery Objective/Criteria: Delist. Establish four viable populations through protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels in the Powell River. Mussel propagation research. Mussel survey of the Powell, Duck, and Elk Rivers.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of the toxic components of coal waste to mussels. Additional mussel surveys in the Powell, Duck, and Elk Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Curtis' pearly mussel 287

1. Species: Curtis' pearly mussel (*Epioblasma florentina curtisi*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: A Recovery Plan for the Curtis' Pearly Mussel
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/February 4, 1986
9. Recovery Objective/Criteria: Delist. The species will be considered to be recovered when 1) viable populations occur in four streams which are sufficiently separate so that a single event would be unlikely to affect more than one population, 2) the four populations are surrounded by a protected riparian zone, and 3) the populations are protected from the adverse effects resulting from any future man-made changes.
10. Major Activity Since Last Report: A riparian purchase of over one mile of one of the two rivers believed to contain the species has resulted in the stream bank stabilizing and improving water quality.
11. Major Activity Over Next Reporting Period: Monitoring of the mussel beds in the two streams will be done next year. Section 7 consultation will be used to protect habitat when appropriate.
12. Recovery Achieved: 1
13. Information Current as of: July 25, 1990

288 Dromedary pearly mussel

1. Species: Dromedary pearly mussel (*Dromus dromas*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 4C
6. Recovery Plan Title: Dromedary Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 22, 1984
9. Recovery Objective/Criteria: Delist. Establish five viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels. Mussel propagation research. Mussel survey of the Clinch, Powell, and Tennessee Rivers.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of coal waste on mussels. Additional mussel surveys in the Clinch, Powell, and Tennessee Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

289 Green-blossom pearly mussel

1. Species: Green-blossom pearly mussel (*Epioblasma torulosa gubernaculum*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining, may be extinct
5. Recovery Priority: 6
6. Recovery Plan Title: Green-Blossom Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 9, 1984
9. Recovery Objective/Criteria: Delist. Establish four viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels. Mussel propagation research. Mussel survey of the Clinch and Powell Rivers.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of coal waste on mussels. Additional mussel surveys in the Clinch and Powell Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Higgins' eye pearly mussel 290

Species: Higgins' eye pearly mussel (*Lampsilis higginsi*)

Listing/Date: Endangered/June 14, 1976

Group: Clams

Species Status: Unknown

Recovery Priority: 2C

Recovery Plan Title: Higgins' Eye Pearly Mussel Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 3

Recovery Plan Stage/Date: F/July 29, 1983

9. Recovery Objective/Criteria: Delist. The species will be considered recovered when 5 separate viable populations exist and are shown to be stable over a 10-year period. These populations should be in five separate pools of the Mississippi River.
10. Major Activity Since Last Report: The U.S. Army Corps of Engineers Waterways Experiment Station is continuing a long-term study of barge and navigation impacts on the species at six sites in the Upper Mississippi River. Section 7 consultation continues to protect known and suspected sites occupied by the species, including the largest known population at Prairie du Chien, Wisconsin. Monitoring at that site is measuring acute and chronic effects of current barge traffic over the mussel bed. A separate study is gathering baseline data on a Higgins' eye mussel bed in the Mississippi River to be used in future monitoring activities.
11. Major Activity Over Next Reporting Period: Section 7 protection, Prairie du Chien monitoring, and studies will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 24, 1990

Little-wing pearly mussel 291

Species: Little-wing pearly mussel (*Pegias fabula*)

Listing/Date: Endangered/November 14, 1988

Group: Clams

Species Status: Declining

Recovery Priority: 4

Recovery Plan Title: Little-Wing Pearly Mussel Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: F/September 22, 1989

Recovery Objective/Criteria: Delist. Establish 13 viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.

10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels. Mussel propagation research. Mussel survey of the Cumberland River system. Evaluation of mussel instream flow needs. Determination of fish hosts.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of coal waste on mussels. Additional mussel surveys in the Cumberland River system. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Continuation of instream flow needs study.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

292 Orange-footed pearly mussel

1. Species: Orange-footed pearly mussel (*Plethobasus cooperianus*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Orange-Footed Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 30, 1984
9. Recovery Objective/Criteria: Delist. Establish five viable populations through the protection of existing populations and through discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel survey of the Ohio and Tennessee Rivers.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Additional mussel surveys in the Ohio and Tennessee Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

293 Pale lilliput pearly mussel

1. Species: Pale lilliput pearly mussel (*Toxolasma* (=*Caruncunlina*) *cylindrellus*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for the Pale Lilliput Pearly Mussel (*Toxolasma cylindrellus*)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 22, 1984
9. Recovery Objective/Criteria: Delist. Protect populations in the Paint Rock River, Estill Fork, and Hurricane Creek. Discovery or reestablishment and protection of new populations in two additional historic localities. Noticeable improvements in substrate quality are achieved and maintained.
10. Major Activity Since Last Report: No action taken.
11. Major Activity Over Next Reporting Period: Determine the species' current status, distribution and habitat requirements in the Paint Rock River System.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Pink mucket pearly mussel 294

1. Species: Pink mucket pearly mussel (*Lampsilis orbiculata*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pink Mucket Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/June 24, 1985
9. Recovery Objective/Criteria: Delist. Establish 18 viable populations through protection of existing populations and discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel survey of the Clinch, Ohio, Kanawha, Tennessee, Green, and Barrens Rivers. Life history investigations in the Green River.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Additional mussel surveys in the Clinch, Ohio, Kanawha, Tennessee, Green, and Barrens Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Continuation of life history investigations in the Green River.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Purple cat's paw pearly mussel 295

1. Species: Purple cat's paw pearly mussel (*Epioblasma* (*=Dysnomia*) *o. obliquata* (*=sulcata*))
2. Listing/Date: Endangered/July 10, 1990
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act. Conducted surveys in the Green River.
11. Major Activity Over Next Reporting Period: Conduct mussel propagation research. Conduct additional mussel surveys in the Tennessee, Clinch, and Green Rivers. Develop an educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Investigate the life history of the species in the Green River.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

296 Tubercled-blossom pearly mussel

1. Species: Tubercled-blossom pearly mussel (*Epioblasma torulosa torulosa*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Extinct
5. Recovery Priority: 6
6. Recovery Plan Title: Tubercled-Blossom Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 25, 1985
9. Recovery Objective/Criteria: No criteria for recovery exists. Recovery objectives will be established if a population of the species can be found.
10. Major Activity Since Last Report: Mussel propagation research.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

297 Turgid-blossom pearly mussel

1. Species: Turgid-blossom pearly mussel (*Epioblasma turgidula*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Extinct
5. Recovery Priority: 5
6. Recovery Plan Title: Turgid-Blossom Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 25, 1985
9. Recovery Objective/Criteria: No criteria for recovery exists. Recovery objectives will be established if a population of the species can be found.
10. Major Activity Since Last Report: Mussel propagation research.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

White cat's paw pearly mussel 298

1. Species: White cat's paw pearly mussel (*Epioblasma sulcata delicata = E. obliquata perobliqua*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Unknown
5. Recovery Priority: 6
6. Recovery Plan Title: Recovery Plan for the White Cat's Paw Pearly Mussel
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/January 25, 1990
9. Recovery Objective/Criteria: Stabilize. Recovery and delisting of the subspecies are not anticipated due to extremely low population levels and no recent evidence of recruitment. Downlisting to threatened status may occur if (1) the Fish Creek population proves to be viable and self-maintaining and receives protection from adverse activities; and (2) three additional, viable populations are discovered or reestablished and protected.
10. Major Activity Since Last Report: Recovery Plan has been completed. Mussel collecting has been prohibited in the Ohio portion of Fish Creek. In addition, Service has met with Indiana and Ohio DNR to plan landowner contact program throughout species watershed.
11. Major Activity Over Next Reporting Period: Landowner contacts will be made by state and The Nature Conservancy (TNC) representatives under cooperative agreement funding from the Service. Sources of water quality problems will be identified and remedies sought.
12. Recovery Achieved: 1
13. Information Current as of: July 24, 1990

White warty-back pearly mussel 299

1. Species: White warty-back pearly mussel (*Plethobasus cicatricosus*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: White Warty-Back Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 19, 1984
9. Recovery Objective/Criteria: Delist. Establish 3 viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel survey of the Ohio and Tennessee River.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Additional mussel surveys in the Ohio and Tennessee River. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

300 Yellow-blossom pearly mussel

1. Species: Yellow-blossom pearly mussel (*Epioblasma florentina florentina*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Extinct
5. Recovery Priority: 6
6. Recovery Plan Title: Yellow-Blossom Pearly Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 25, 1985
9. Recovery Objective/Criteria: No criteria for recovery exists. Recovery objectives will be established if a population of the species can be found.
10. Major Activity Since Last Report: Mussel propagation research.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

301 Fine-rayed pigtoe

1. Species: Fine-rayed pigtoe (*Fusconia cuneolus*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Fine-Rayed Pigtoe Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 19, 1984
9. Recovery Objective/Criteria: Delist. Establish eight viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels. Mussel propagation research. Mussel survey of the Clinch, Powell, and Holston Rivers. Life history study completed.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of coal waste to mussels. Additional mussel surveys in the Clinch, Powell, Holston, Paint Rock, and Sequatchie Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Rough pigtoe 302

1. Species: Rough pigtoe (*Pleurobema plenum*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Rough Pigtoe Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 6, 1984
9. Recovery Objective/Criteria: Delist. Establish six viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel survey of the Clinch, Tennessee, Green, and Barrens Rivers. Life history investigations in the Green River.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Additional mussel surveys in the Clinch, Tennessee, Green, and Barrens Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Continuation of life history investigations in the Green River.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Shiny pigtoe mussel 303

1. Species: Shiny pigtoe mussel (*Fusconaia edgariana*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Shiny Pigtoe Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 9, 1984
9. Recovery Objective/Criteria: Delist. Establish seven viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Study of the impacts of coal related silt and toxic components of coal waste on mussels. Mussel propagation research. Mussel survey of the Clinch, Powell, and Holston Rivers. Life history study completed.
11. Major Activity Over Next Reporting Period: Continuation of research on mussel propagation and on the impact of coal waste to mussels. Additional mussel surveys in the Clinch, Powell, Holston, Paint Rock, and Sequatchie Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

The shiny pigtoe mussel is now restricted to Virginia, Tennessee and Alabama. Like the majority of endangered mussels, the species is declining. The pigtoe requires clear, clean, fast-flowing rivers and streams with stable substrates. The disappearance of this habitat due to impoundments and water pollution has restricted the ability of the Fish and Wildlife Service to restore the species. Preservation of existing populations is critical to their survival and eventual recovery.

304 Fat pocketbook

1. Species: Fat pocketbook (*Potamilus capax*)
2. Listing/Date: Endangered/June 14, 1976
3. Group: Clams
4. Species Status: Improving
5. Recovery Priority: 2C
6. Recovery Plan Title: A Recovery Plan for the Fat Pocketbook Pearly Mussel *Potamilus capax* (Green 1832)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: R/Rev/March 28, 1989—F/October 4, 1985.
9. Recovery Objective/Criteria: Downlist. Existing population in the St. Francis Floodway and the tributary streams and ditches is protected from habitat modification; and at least two viable populations are located in two other river systems within historic range, including the upper Mississippi River, the White or Wabash Rivers in Indiana, or others.
10. Major Activity Since Last Report: Transplants to upper Mississippi River by Missouri Department of Conservation; survey of tributary ditch to St. Francis Floodway and extension of population in Little Bay Ditch; survey in Wabash River system.
11. Major Activity Over Next Reporting Period: Monitor transplanted populations; survey affects of Corps of Engineer dredging in St. Francis Floodway; survey of Wabash River system population.
12. Recovery Achieved: 2
13. Information Current as of: June 1990

305 Speckled pocketbook

1. Species: Speckled pocketbook (*Lampsilis streckeri*)
2. Listing/Date: Endangered/February 28, 1989
3. Group: Clams
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Tan riffle shell

306

1. Species: Tan riffle shell (*Epioblasma walkeri*)
2. Listing/Date: Endangered/August 27, 1977
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Tan Riffle Shell Mussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 28, 1984
9. Recovery Objective/Criteria: Delist. Establish four viable populations through the protection of existing populations and through the discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel survey of the Clinch and Duck Rivers.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Additional mussel surveys in the Clinch, Holston, and Duck Rivers. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Stirrup shell

307

1. Species: Stirrup shell (*Quadrula stapes*)
2. Listing/Date: Endangered/April 7, 1987
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Five Tombigbee River Mussels Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 14, 1989
9. Recovery Objective/Criteria: Prevent extinction and protect the remaining range of the species.
10. Major Activity Since Last Report: Survey and habitat assessment of the Tombigbee River at Gainesville Bendway, AL (FY 88). No stirrup shells were found. This historic population site has been affected by the construction of the Tennessee Tombigbee Waterway. The lower reaches of the Bendway are heavily silted.
11. Major Activity Over Next Reporting Period: Historic habitat in the lower Sipsey River in Alabama will be searched and assessed.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

308 James River spinymussel

1. Species: James River spinymussel (*Pleurobema collina*)
2. Listing/Date: Endangered/July 22, 1988
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: James River Spinymussel (*Pleurobema collina*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/September 24, 1990
9. Recovery Objective/Criteria: Downlist when all known populations stable or expanding. There are widely distributed populations in at least four rivers. All known habitats are protected from threats.
10. Major Activity Since Last Report: Surveys conducted. Host fishes and life history requirements determined. Finalized recovery plan.
11. Major Activity Over Next Reporting Period: Conduct additional surveys within the species' historic range.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

309 Tar River spinymussel

1. Species: Tar River spinymussel (*Elliptio steinstansana*)
2. Listing/Date: Endangered/June 27, 1985
3. Group: Clams
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Tar River Spinymussel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 16, 1987
9. Recovery Objective/Criteria: Downlist. Establish two viable populations through the protection of existing populations and discovery and/or creation of additional populations.
10. Major Activity Since Last Report: Mussel propagation research. Mussel surveys of the Tar River system. Life history study of a related species was completed.
11. Major Activity Over Next Reporting Period: Continuation of mussel propagation research. Develop educational video on the plight of freshwater mussels and develop techniques to cryopreserve mussels. Continue to monitor population in the Tar River system.

Critically endangered, the Tar River spinymussel is only found in a short stretch of the Tar River in North Carolina. Fewer than 500 individuals exist. Like seve other endangered mussels, the species is threatene by competition from the introduced Asiatic clam, as as habitat modification and degradation.

12. Recovery Achieved: 1
13. Information Current as of: Jun 25, 1990

Hay's Spring amphipod 310

1. Species: Hay's Spring amphipod (*Stygobromus hayi*)
2. Listing/Date: Endangered/February 5, 1982
3. Group: Crustaceans
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: N/A
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: N/A
9. Recovery Objective/Criteria: Stabilize/Protect the amphipod's spring habitat.
10. Major Activity Since Last Report: Habitat protection and monitoring.
11. Major Activity Over Next Reporting Period: Continued habitat protection and monitoring. Investigate recharge area.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Cave crayfish 311

1. Species: Cave crayfish (*Cambarus zophonastes*)
2. Listing/Date: Endangered/April 7, 1987
3. Group: Crustaceans
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: A Recovery Plan for the Cave Crayfish (*Cambarus zophonastes*)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 26, 1988
9. Recovery Objective/Criteria: Delist. Discovery of nine new populations. Protection of five populations and their habitat.
10. Major Activity Since Last Report: The cave entrance and surrounding area have been purchased by the Arkansas Natural Heritage Commission. The recharge area has been delineated.
11. Major Activity Over Next Reporting Period: Survey caves for additional populations as funding becomes available.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

312 Nashville crayfish

1. Species: Nashville crayfish (*Orconectes shoupi*)
2. Listing/Date: Endangered/September 26, 1986
3. Group: Crustaceans
4. Species Status: Unknown
5. Recovery Priority: 11C
6. Recovery Plan Title: Nashville Crayfish Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/February 8, 1989; F/August 12, 1987
9. Recovery Objective/Criteria: Downlist. Establish two viable populations through the protection of the existing population and through the discovery and/or creation of additional population.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Tennessee has submitted Nashville crayfish Section 6 proposals, but no funding has been available. They will likely submit another request this year; and if funds are available, a life history and threat analysis may be funded.
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

313 Shasta crayfish

1. Species: Shasta crayfish (*Pacifastacus fortis*)
2. Listing/Date: Endangered/September 30, 1988
3. Group: Crustaceans
4. Species Status: Unknown
5. Recovery Priority: 11
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Section 6 surveys and Section 7 consultations.
11. Major Activity Over Next Reporting Period: Assist species recovery via Section 7 consultations .
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Madison Cave isopod 314

Species: Madison Cave isopod (*Antrolana lira*)

Listing/Date: Threatened/October 4, 1982

Group: Crustaceans

Species Status: Stable

Recovery Priority: 4

Recovery Plan Title: N/A

Lead Region/Region Responsible for Recovery Plan: Region 5

Recovery Plan Stage/Date: NA

Recovery Objective/Criteria: Stabilize / Protect the isopod's habitat.

10. Major Activity Since Last Report: Habitat monitoring and protection. There are relatively few sites comprising the isopod's habitat, although other sightings remain possible.

11. Major Activity Over Next Reporting Period: Continued habitat monitoring. Map recharge area. Develop cooperative agreement with landowner.

12. Recovery Achieved: 3

13. Information Current as of: July 1990

Socorro isopod 315

Species: Socorro isopod (*Thermosphaeroma* (= *Exosphaeroma*) *thermophilus*)

Listing/Date: Endangered/March 27, 1978

Group: Crustaceans

Species Status: Improving

Recovery Priority: 2

Recovery Plan Title: Socorro Isopod Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 2

Recovery Plan Stage/Date: F/February 16, 1982

Recovery Objective/Criteria: Stabilize: establish and maintain two additional populations.

10. Major Activity Since Last Report: A captive population continues to be maintained at the University of New Mexico. Modifications to the drain field of the expanded habitat area have been made to eliminate erosion. Quarterly monitoring visits have been made to the site.

11. Major Activity Over Next Reporting Period: The habitat drain field may require further work to control erosion. Monitoring visits will continue and the captive population will be maintained as a backup.

12. Recovery Achieved: 4

13. Information Current as of: August 1, 1990

316

Alabama cave shrimp

1. Species: Alabama cave shrimp (*Palaemonias alabamae*)
2. Listing/Date: Endangered/September 7, 1988
3. Group: Crustaceans
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Alabama Cave Shrimp (*Palaemonias alabamae*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: T
9. Recovery Objective/Criteria: Protect known populations, downlist to threatened status. Five reproducing populations must be identified and protected in five groundwater basins to reclassify.
10. Major Activity Since Last Report: Water quality study of Shelta Cave, and hydrology study of Shelta and Bobcat Cave aquifers have been initiated.
11. Major Activity Over Next Reporting Period: Initiate water quality study. Continue hydrology studies.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

317

California freshwater shrimp

1. Species: California freshwater shrimp (*Syncaris pacifica*)
2. Listing/Date: Endangered/October 31, 1988
3. Group: Crustaceans
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Section 6 surveys and Section 7 Consultations.
11. Major Activity Over Next Reporting Period: Assist species recovery via Section 7 consultations.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Kentucky cave shrimp

318

1. Species: Kentucky cave shrimp (*Palaemonias ganteri*)
2. Listing/Date: Endangered/October 12, 1983
3. Group: Crustaceans
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Kentucky Cave Shrimp Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 7, 1988
9. Recovery Objective/Criteria: To delist the species by protecting, for the foreseeable future, nine viable, reproducing populations of the species
10. Major Activity Since Last Report: Completion of sewage treatment facilities for some of the pollution originating outside of Mammoth Cave National Park
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

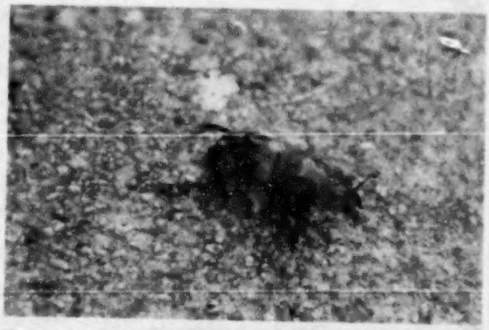
Squirrel Chimney cave shrimp

319

1. Species: Squirrel Chimney (= Florida) cave shrimp (*Palaemonetes cummingi*)
2. Listing/Date: Threatened/June 21, 1990
3. Group: Crustaceans
4. Species Status: Declining
5. Recovery Priority: 17
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: NA
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: The species occurs on only one site that is adequately protected by a single landowner. None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

320 American burying beetle

1. Species: American burying beetle (*Nicrophorus americanus*)
2. Listing/Date: Endangered/July 13, 1989
3. Group: Insects
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: American Burying Beetle Draft Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: U/no date
9. Recovery Objective/Criteria: Downlist / No criteria developed yet.
10. Major Activity Since Last Report: Ecological and reproductive studies on Block Island and captive populations. Surveys in western portion of range. Reintroduction of beetles to suitable habitat. Preparation of draft technical recovery plan initiated. The Block Island population appears stable; other populations continue to decline.
11. Major Activity Over Next Reporting Period: A recovery plan will be prepared. Monitoring of the Block Island population will continue; the reintroduction effort on Penikese Island will also be monitored. Studies will continue.



The American burying beetle feeds primarily on carrion. Small animal carcasses are buried by the beetles and later serve as food for hatching larvae. The beetle was once found in 32 states and in Canada, but is now known from only two populations in Oklahoma and New England. The reason for its drastic decline remains a mystery.

12. Recovery Achieved: 1
13. Information Current as of: July 1990

321 Delta green ground beetle

1. Species: Delta green ground beetle (*Elaphrus viridis*)
2. Listing/Date: Threatened/August 3, 1980
3. Group: Insects
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Solano Grass/Delta Green Ground Beetle Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 11, 1985
9. Recovery Objective/Criteria: Stabilize and protect all known populations for 10 years.
10. Major Activity Since Last Report: Entire population is on California Nature Conservancy lands and is being managed as part of the Nature Conservancy preserve.
11. Major Activity Over Next Reporting Period: Continued management and monitoring by the Nature Conservancy.
12. Recovery Achieved: 1
13. Information Current as of: July 19, 1990

Kretschmarr Cave mold beetle

322

1. Species: Kretschmarr Cave mold beetle (*Texamaurops reddelli*)
2. Listing/Date: Endangered/September 16, 1988
3. Group: Insects
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Progress continued on an Balcones Canyonlands Habitat Conservation Plan (HCP) that will include this species. Service has provided advice directly to several landowners about protective measures that could be taken. Texas Parks and Wildlife Department received Section 6 funds to survey for additional populations of this species.
11. Major Activity Over Next Reporting Period: HCP may be completed, approved, and implementation (including land acquisition) begun. Two Section 6 projects will continue.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

Northeastern beach tiger beetle

323

1. Species: Northeastern beach tiger beetle (*Cicindela dorsalis*)
2. Listing/Date: Threatened/August 7, 1990
3. Group: Insects
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act. Recovery coordination meeting held at Forsythe National Wildlife Refuge. Participants included State, Federal, and private species experts, and collectors. Proposals for recovery actions were prepared.
11. Major Activity Over Next Reporting Period: Continue species monitoring efforts. Conduct genetic studies to compare the taxonomy of the Chesapeake Bay and New England populations. Conduct more surveys, especially in Maryland prior to phragmites control. Investigate potential for possible translocations to establish new populations.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

324

Puritan tiger beetle

1. Species: Puritan tiger beetle (*Cicindela puritana*)
2. Listing/Date: Threatened/August 7, 1990
3. Group: Insects
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act. Recovery coordination meeting held at Forsythe National Wildlife Refuge. Participants included State, Federal, and private species experts, and collectors. Proposals for recovery actions were prepared.
11. Major Activity Over Next Reporting Period: Continue species monitoring efforts. Conduct genetic studies to compare the taxonomy of the Chesapeake Bay and New England populations. Conduct more surveys, especially in Maryland prior to phragmites control. Investigate potential for possible translocations to establish new populations.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

325

Tooth Cave ground beetle

1. Species: Tooth Cave ground beetle (*Rhadine persephone*)
2. Listing/Date: Endangered/September 16, 1988
3. Group: Insects
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Progress continued on an Balcones Canyonlands Habitat Conservation Plan (HCP) that will include this species. Service has provided advice directly to several landowners about protective measures that could be taken. Texas Parks and Wildlife Department received Section 6 funds to survey for additional populations of this species.
11. Major Activity Over Next Reporting Period: HCP may be completed, approved, and implementation (including land acquisition) begun. Two Section 6 projects will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Valley elderberry longhorn beetle 326

Species: Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

Listing/Date: Threatened/August 8, 1980

Group: Insects

Species Status: Unknown

Recovery Priority: 9

Recovery Plan Title: Recovery Plan for the Valley Elderberry Longhorn Beetle

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: F/1984

Recovery Objective/Criteria: Insufficient information on life history, biology, and ecology exists to develop long term recovery goals

10. Major Activity Since Last Report: Survey of Sacramento and Consumnes Rivers for species, larvae study contract on Consumnes River.

11. Major Activity Over Next Reporting Period: Gather more information on life cycle and distribution before evaluating the species for recovery requirements.

12. Recovery Achieved: 1

13. Information Current as of: July 19, 1990

Bay checkerspot butterfly 327

Species: Bay checkerspot butterfly (*Euphydryas editha bayensis*)

Listing/Date: Threatened/September 18, 1987

Group: Insects

Species Status: Declining

Recovery Priority: 3

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: U

Recovery Objective/Criteria: To be developed

10. Major Activity Since Last Report: Section 7 consultations (both formal and informal).

11. Major Activity Over Next Reporting Period: Advise local agencies and private parties of the value of Habitat Conservation Plans for species and continue to attempt to protect remaining habitat.

12. Recovery Achieved: 1

13. Information Current as of: August 23, 1990

328 El Segundo blue butterfly

1. Species: El Segundo blue butterfly (*Euphilotes battoides allyni*)
2. Listing/Date: Endangered/June 1, 1976
3. Group: Insects
4. Species Status: Unknown
5. Recovery Priority: 12
6. Recovery Plan Title: Recovery Plan for El Segundo blue butterfly, (*Euphilotes battoides allyni*)
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 22, 1986
9. Recovery Objective/Criteria: Enhance existing habitat and to maintain and increase the population.
10. Major Activity Since Last Report: Few activities—one report completed.
11. Major Activity Over Next Reporting Period: None planned.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

329 Lange's metalmark butterfly

1. Species: Lange's metalmark butterfly (*Apodemia mormo langei*)
2. Listing/Date: Endangered/June 1, 1976
3. Group: Insects
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for Three Endangered Species Endemic to Antioch Dunes, California
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/April 25, 1984
9. Recovery Objective/Criteria: Stabilize population status.
10. Major Activity Since Last Report: Control some exotic vegetation, expand larval host plant.
11. Major Activity Over Next Reporting Period: Continue #10
12. Recovery Achieved: 1
13. Information Current as of: July 19, 1990

Lotis blue butterfly 330

1. Species: Lotis blue butterfly (*Lycaeides argyrognomon lotis*)
2. Listing/Date: Endangered/June 1, 1976
3. Group: Insects
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: Lotis Blue Butterfly Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/December 26, 1985
9. Recovery Objective/Criteria: Stabilize known population, establish three additional colonies
10. Major Activity Since Last Report: Pacific Gas and Electric Company conducted status reviews and habitat quality surveys in 1990.
11. Major Activity Over Next Reporting Period: Pacific Gas and Electric Company will continue status reviews through 1991.
12. Recovery Achieved: 1
13. Information Current as of: July 19, 1990

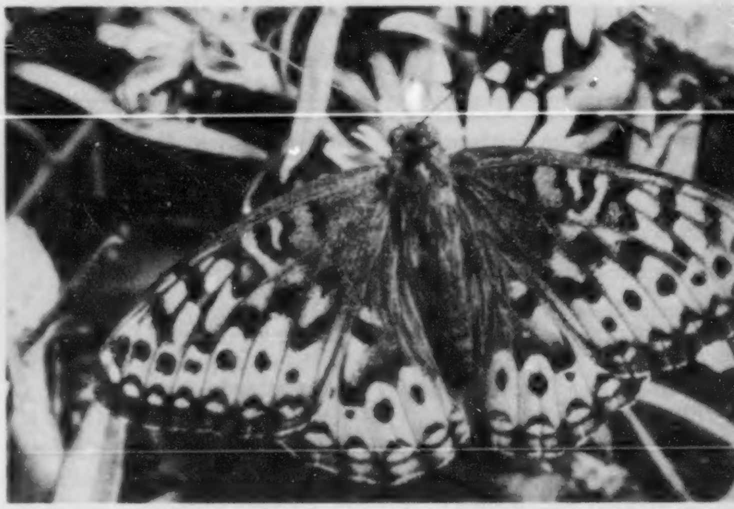
Mission blue butterfly 331

1. Species: Mission blue butterfly (*Icaricia icarioides missionensis*)
2. Listing/Date: Endangered/June 1, 1976
3. Group: Insects
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: San Bruno Elfin and Mission Blue Butterflies Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/1985
9. Recovery Objective/Criteria: Protect, maintain, and enhance current populations.
10. Major Activity Since Last Report: Implementation of San Bruno Mountain Habitat Conservation Plan.
11. Major Activity Over Next Reporting Period: Restore, enhance, and maintain populations, implement conservation plan.
12. Recovery Achieved: 2
13. Information Current as of: July 19, 1990

The Mission blue butterfly inhabits grasslands and coastal scrub in California. In order to protect the species from suburban development, the Fish and Wildlife Service, working with developers and local governments, developed a habitat conservation plan for the San Bruno Mountains. Several hundred acres of habitat were set aside so development of the surrounding area could continue.

332 Oregon silverspot butterfly

1. Species: Oregon silverspot butterfly (*Speyeria zerene hippolyta*)
2. Listing/Date: Endangered/July 2, 1980
3. Group: Insects
4. Species Status: Declining (Loss of habitat, declining numbers of butterflies over years)
5. Recovery Priority: 9
6. Recovery Plan Title: Oregon Silverspot Butterfly Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: R/Rev/September 22, 1982
9. Recovery Objective/Criteria: Stabilize; criteria are being developed by the Recovery Team.
10. Major Activity Since Last Report: Population surveys, habitat manipulation, and acquisition efforts initiated by Washington Department of Wildlife at Long Beach, Washington. Oregon silverspot butterfly recovery team formed to revise Recovery Plan. Siuslaw National Forest developed management plans for four habitat areas on National Forest lands (Hammond 1989). Bray Point Area was purchased by the Siuslaw National Forest. Bray Point has an existing Oregon silverspot butterfly colony. One Habitat Conservation Plan HCP) is being developed for Clatsop Plains and two additional HCPs are being contemplated. 1988 surveys of *Viola adunca* habitat and Oregon silverspot butterflies were conducted by P. Hammond for the Service at Clatsop Plains, Clatsop County, Oregon. Oregon silverspot butterfly working group met on May 11, 1990. Study of the relationships of habitat to courtship commenced at Cascade Head. An evaluation of the effect of the 1988 burn at north slope Cascade Head was begun in 1990 by The Nature Conservancy. Meadow habitat at Rock Creek and Mount Hebo are secure from invasion by shrubs and trees through ongoing habitat manipulation efforts. Continue population monitoring, restoration and rehabilitation of existing grassland meadow habitat, and habitat monitoring at Cascade Head, Mt. Hebo, and Rock Creek.
11. Major Activity Over Next Reporting Period: Develop a draft Recovery Plan for technical review. Continue population monitoring, restoration and rehabilitation of existing grassland meadow habitat and habitat monitoring at Cascade Head, Mt. Hebo, and Rock Creek. Search for potential areas for establishment of additional populations, renovate habitat at Roads End and Fairview Mountain, and introduce butterflies at Fairview Mountain. Siuslaw National Forest seeks to protect additional existing and potential habitat at Rock Creek through purchase of adjacent private land. Maintenance of openings in forest fringes and inland meadows used by adult butterflies until further studies determine appropriate management needs for these areas.
12. Recovery Achieved: 2
13. Information Current as of: July 24, 1990



The Oregon silverspot is found in salt spray meadows along the coasts of Washingto and Oregon. It is heavily dependent on the western blue violet, which serves at the host for the butterfly's larvae. A habitat conservation plan has been developed for the species to accommodate continued development as well as protection of the species

Palos Verdes blue butterfly 333

1. Species: Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdesensis*)
2. Listing/Date: Endangered/July 2, 1980
3. Group: Insects
4. Species Status: Declining (possibly extinct)
5. Recovery Priority: 6
6. Recovery Plan Title: Palos Verdes Blue Butterfly Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Halt the loss and degradation of remaining habitat.
10. Major Activity Since Last Report: Conducted a few surveys that revealed no presence of this species.
11. Major Activity Over Next Reporting Period: Comprehensive surveys to determine if species still exists.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

San Bruno elfin butterfly 334

1. Species: San Bruno elfin butterfly (*Callophrys mossii bayensis*)
2. Listing/Date: Endangered/June 1, 1976
3. Group: Insects
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: San Bruno Elfin and Mission Blue Butterflies Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/1985
9. Recovery Objective/Criteria: Protect, maintain, and enhance current populations.
10. Major Activity Since Last Report: Implementation of San Bruno Mountain Habitat Conservation Plan.
11. Major Activity Over Next Reporting Period: Restore, enhance, and maintain populations, implement conservation plan.
12. Recovery Achieved: 2
13. Information Current as of: July 19, 1990

335 Schaus swallowtail butterfly

1. Species: Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*)
2. Listing/Date: Endangered/August 31, 1984
3. Group: Insects
4. Species Status: Declining
5. Recovery Priority: 3C
6. Recovery Plan Title: Schaus Swallowtail Butterfly Recovery Plan.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/November 17, 1982
9. Recovery Objective/Criteria: Objective is to prevent the extirpation of extant colonies and reestablish colonies where suitable habitat remains within historic range.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated
12. Recovery Achieved: 1
13. Information Current as of: July 1990

336 Smith's blue butterfly

1. Species: Smith's blue butterfly (*Euphilotes enoptes smithi*)
2. Listing/Date: Endangered/July 1, 1976
3. Group: Insects
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Smith's Blue Butterfly Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/November 9, 1984
9. Recovery Objective/Criteria: Downlist to threatened when 10 sites which contain viable, self-sustaining populations have been secured. Remove from list when, after 10 consecutive years, a total of 18 sites appear to be permanently protected and the butterflies at these sites are not threatened.
10. Major Activity Since Last Report: Working on protecting habitat through the development of two Habitat Conservation Plans with Sand City and the City of Marina.
11. Major Activity Over Next Reporting Period: Continue working with the two cities to complete the Habitat Conservation Plans.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Kern primrose sphinx moth

337

1. Species: Kern primrose sphinx moth (*Euproserpinus euterpe*)
2. Listing/Date: Threatened/April 8, 1980—Endangered/June 1, 1976
3. Group: Insects
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Kern Primrose Sphinx Moth Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/February 8, 1984
9. Recovery Objective/Criteria: Delist when three additional colonies established and known population maintained and protected for 10 consecutive years
10. Major Activity Since Last Report: Surveys conducted by FWS in 1989 on larva plant distribution and abundance. Dr. Oakley Shields captured one butterfly and saw another during surveys in spring 1990.
11. Major Activity Over Next Reporting Period: Sacramento field office plans a week-long status survey to determine population size in 1991.
12. Recovery Achieved: 1
13. Information Current as of: July 19, 1990

Ash Meadows naucorid

338

1. Species: Ash Meadows naucorid (*Ambrysus amargosus*)
2. Listing/Date: Threatened/May 20, 1985
3. Group: Insects
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting— all of following conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish.

   Delisting— following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and 4 candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September 1990

339 Pawnee montane skipper

1. Species: Pawnee montane skipper (*Hesperia leonardus montana*)
2. Listing/Date: Threatened/September 25, 1987
3. Group: Insects
4. Species Status: Stable
5. Recovery Priority: 9C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: A management agreement has been signed by an Interagency Committee (with members comprised of the Denver Water Department and various Federal agencies) regarding management of this species in the event of approval of the Two Forks project. The agreement includes land acquisition to protect habitat, management of existing properties to benefit the species, long-term studies, and population monitoring.
11. Major Activity Over Next Reporting Period: Recovery actions are dependent upon approval or denial of the Two Forks project. Once a decision on this project is made, a recovery plan can be initiated and the direction of recovery actions can be determined.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

340 Bee Creek Cave harvestman

1. Species: Bee Creek Cave harvestman (*Texella reddelli*)
2. Listing/Date: Endangered/September 16, 1988
3. Group: Arachnids
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Progress continued on an Balcones Canyonlands Habitat Conservation Plan (HCP) that will include this species. Service has provided advice directly to several landowners about protective measures that could be taken. Texas Parks and Wildlife Department received Section 6 funds to survey for additional populations of this species.
11. Major Activity Over Next Reporting Period: HCP may be completed, approved, and implementation (including land acquisition) begun. Two Section 6 projects will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Tooth Cave pseudoscorpion

341

1. Species: Tooth Cave pseudoscorpion (*Microcreagris texana*)
2. Listing/Date: Endangered/September 16, 1988
3. Group: Arachnids
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Progress continued on an Balcones Canyonlands Habitat Conservation Plan (HCP) that will include this species. Service has provided advice directly to several landowners about protective measures that could be taken. Texas Parks and Wildlife Department received Section 6 funds to survey for additional populations of this species.
11. Major Activity Over Next Reporting Period: HCP may be completed, approved, and implementation (including land acquisition) begun. Two Section 6 projects will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Tooth Cave spider

342

1. Species: Tooth Cave spider (*Leptoneta myopica*)
2. Listing/Date: Endangered/September 16, 1988
3. Group: Arachnids
4. Species Status: Unknown
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Progress continued on an Balcones Canyonlands Habitat Conservation Plan (HCP) that will include this species. Service has provided advice directly to several landowners about protective measures that could be taken. Texas Parks and Wildlife Department received Section 6 funds to survey for additional populations of this species.
11. Major Activity Over Next Reporting Period: HCP may be completed, approved, and implementation (including land acquisition) begun. Two Section 6 projects will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Appendix IV. Plants

Achyranthes splendens var. *rotundata* 343

1. Species: Round-leaved chaff-flower (*Achyranthes splendens* var. *rotundata*)
2. Listing/Date: Endangered/March 26, 1986
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Arizona agave 344

1. Species: Arizona agave (*Agave arizonica*)
2. Listing/Date: Endangered/May 18, 1984
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Stabilize/No Recovery Plan
10. Major Activity Since Last Report: Forest Service conducted surveys and located some previously unknown plants. The action slightly increased the number of known plants. The Forest Service is discussing the terms of the livestock grazing permit with the most recent permit holder. The Forest Service hopes to reduce the number of livestock on the allotment, thereby reducing grazing pressure and improving the habitat for the listed species. Forest Service contractor will conduct studies into the taxonomy and pollination ecology of this species. The taxonomy of the species has been questioned and the research will help answer these questions.
11. Major Activity Over Next Reporting Period: Forest Service surveys and taxonomy/pollination ecology studies will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

345 Ewa Plains 'akoko

1. Species: Ewa Plains 'akoko (*Chamaesyce skottsbergii* var. *kalaeloana*)
2. Listing/Date: Endangered/August 24, 1982
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 12
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

346 Little amphiathus

1. Species: Little amphiathus (*Amphianthus pusillus*)
2. Listing/Date: Threatened/February 5, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 13
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: All populations were visited in order to have accurate distributional information for upcoming recovery plan.
11. Major Activity Over Next Reporting Period: Emphasis will be placed on the development of the recovery plan which will be completed by September 1990. Key landowners will be contacted and a monitoring program will be initiated if funds become available.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Bunched arrowhead 347

1. Species: Bunched arrowhead (*Sagittaria fasciculata*)
2. Listing/Date: Endangered/July 25, 1979
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Bunched Arrowhead Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 8, 1983
9. Recovery Objective/Criteria: Downlisting can be considered when 15 colonies distributed across drainages and physiographic provinces are permanently protected. Delisting can be considered when 26 colonies are protected across a similar distribution.
10. Major Activity Since Last Report: Known populations have been monitored, research has been conducted on habitat requirements and population demography, additional populations have been searched for; habitat has been acquired and protected for two populations in South Carolina, and negotiations are under way for acquisition of a third site in North Carolina.
11. Major Activity Over Next Reporting Period: Protection efforts for important populations will continue.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Decurrent false aster 348

1. Species: Decurrent false aster (*Boltonia decurrens*)
2. Listing/Date: Threatened/November 14, 1988
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Decurrent False Aster (*Boltonia decurrens*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Delisting may be considered when 12 geographically distinct, self-sustaining natural or established populations of the species are protected, and remain stable to expanding for a 5-year period.
10. Major Activity Since Last Report: A recovery team was formed, and prepared a recovery plan.
11. Major Activity Over Next Reporting Period: Continue to search for new populations, develop management plans and cooperative agreements for those populations on public lands, monitor existing populations, and introduce plants to a new site on Missouri Department of Conservation lands.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

The decurrent false aster is a native of prairie wetlands in Illinois and Missouri. The Fish and Wildlife Service is cooperating with the U.S. Army Corps of Engineers and the Missouri Department of Conservation to develop a cooperative management agreement for the species.

349 Florida golden aster

1. Species: Florida golden aster (*Chrysopsis floridana*)
2. Listing/Date: Endangered/May 16, 1986
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for Florida Golden Aster
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 29, 1988
9. Recovery Objective/Criteria: Consider downlisting to threatened when 10 geographically distinct self-sustaining populations are protected.
10. Major Activity Since Last Report: Hillsborough County has worked to protect a small population in a development; the county's tree and vegetation protection ordinance requires review of development proposals to protect endangered plant habitat.
11. Major Activity Over Next Reporting Period: None known.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

350 Ruth's golden aster

1. Species: Ruth's golden aster (*Pityopsis ruthii*)
2. Listing/Date: Endangered/July 18, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Recovery Plan for Ruth's Golden Aster
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: T
9. Recovery Objective/Criteria: Delist the species when there are stable, self-sustaining populations on the Ocoee and Hiwassee Rivers
10. Major Activity Since Last Report: Development of technical draft recovery plan
11. Major Activity Over Next Reporting Period: Preparation of agency draft and final recovery plans
12. Recovery Achieved: 1
13. Information Current as of: June 25, 1990

Spreading avens 351

pecies: Spreading avens (*Geum*
diatum)

isting/Date: Endangered/July
1, 1989

roup: Plants

pecies Status: Declining

ecovery Priority: 2

ecovery Plan Title: Pending

ead Region/Region Responsible
r Recovery Plan: Region 4

ecovery Plan Stage/Date: U

ecovery Objective/Criteria: To
e developed.

lajor Activity Since Last Report:
lajor landowners have been con-
cted regarding protection of the
ant on their lands; research has
een initiated on population biol-
gy, genetics, and habitat require-
ents; seed has been collected from most of the surviving populations and reintroduction experiments have begun; the Fish and Wildlife Service and the National Park Service are redesigning a heavily-used visitor facility on the Blue Ridge Parkway to prevent further impact to this species and other rare plants at the site.

11. Major Activity Over Next Reporting Period: Continuation of the above mentioned work.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Truckee barberry 352

pecies: Truckee barberry
ahonia (=Berberis) sonnei)

isting/Date:
ndangered/November 6, 1979

roup: Plants

pecies Status: Stable

ecovery Priority: 2C

ecovery Plan Title: Truckee
arberry Recovery Plan

ead Region/Region Responsible
r Recovery Plan: Region 1

ecovery Plan Stage/Date: F/June
0, 1984

ecovery Objective/Criteria:
ownlist when known population
abilized and 5 new populations
f 100+ plants are established.

10. Major Activity Since Last Report: Results of study financed by Section 6 concluded that *B. sonnei* should be included as part of another species, *B. repens*. Service waiting until treatment of genus in the scientific literature before proceeding with an evaluation as to whether or not to maintain on the list.
11. Major Activity Over Next Reporting Period: To be determined.
12. Recovery Achieved: 1
13. Information Current as of: July 17, 1990

353 Bariaco

1. Species: Bariaco (*Trichilia triacantha*)
2. Listing/Date: Endangered/February 5, 1988
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for Bariaco (*Trichilia triacantha*)
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/September 1989
9. Recovery Objective/Criteria: Downlist/ Stabilize the species to self-sustaining status when the known population at Punta Guaniquilla is placed under protective status and when at least three new populations capable of self-perpetuation have been established within protected units.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

354 Dwarf bear-poppy

1. Species: Dwarf bear-poppy (*Arctomecon humilis*)
2. Listing/Date: Endangered/November 6, 1979
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Dwarf Bear-poppy Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/December 31, 1985
9. Recovery Objective/Criteria: Downlist. Reduce threats to this species by controlling and managing off-road vehicle use and mining, and secure habitat areas through conservation easements, exchanges of State of Utah lands, and designating Areas of Critical Environmental Concern on Federal lands.
10. Major Activity Since Last Report: The population has experienced a large die-off due apparently to cyclical natural factors. Federal and State governments have closed bear-poppy habitat areas to off-road vehicle (ORV) use; however ORV use is continuing illegally despite posting. Studies on the species' biology and ecology are being conducted primarily through university programs. Monitoring studies and studies on reproduction and pollination biology are being conducted.
11. Major Activity Over Next Reporting Period: Population monitoring will continue. Construction of fences to physically protect portions of the population from unauthorized ORV use will be accomplished.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Penland beardtongue 355

: Penland beardtongue
mon penlandii)

/Date: Endangered/July
9

Plants

Status: Stable

ry Priority: 14

ry Plan Title: Penland
ongue/Osterhout Milk-
Recovery Plan

egion/Region Responsible
overy Plan: Region 6

ry Plan Stage/Date: T/A

ry Objective/Criteria:
vation of existing popula-

10. Major Activity Since Last Report: Purchase of occupied habitat on private land by Nature Conservancy and Colorado River Water Conservation District has begun. Seeds were collected and viability tests were conducted in 1989

11. Major Activity Over Next Reporting Period: Seeds will be collected again in 1990 and germination techniques will be tested. The recovery plan will be drafted in 1990/91. This will be a joint recovery plan with the Osterhout milk-vetch.

12. Recovery Achieved: 2

13. Information Current as of: September 1990

Harper's beauty 356

s: Harper's beauty
rocallis flava)

/Date:
gered/October 2, 1979

Plants

s Status: Improving

ery Priority: 7

ery Plan Title: Harper's
(*Harperocallis flava*)
ery plan.

Region/Region Responsible
covery Plan: Region 4

ery Plan Stage/Date:
ember 14, 1983

ery Objective/Criteria:
's beauty may be consid-
r downlisting to threatened
five populations (in habitat
to the type locality, away
he roadside where most
's beauty plants now exist)
have two colonies each or when three populations have three colonies each. Delisting may be considered when a minimum of five secure wild populations, with a minimum of three colonies each, have been found or established.

10. Major Activity Since Last Report: Transplants of plugs of sod containing Harper's beauty from a roadside to seemingly suitable habitats appear successful.

11. Major Activity Over Next Reporting Period: Continue work on transplants.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

357 Brooksville bellflower

1. Species: Brooksville bellflower (*Campanula robinsiae*)
2. Listing/Date: Endangered/July 27, 1989
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Brooksville Bellflower and Cooley's water-willow.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Technical/Agency Recovery Plan in preparation.
11. Major Activity Over Next Reporting Period: Complete recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

358 Cuneate bidens

1. Species: Cuneate bidens (*Bidens cuneata*)
2. Listing/Date: Endangered/February 17, 1984
3. Group: Plants
4. Species Status: Extinct
5. Recovery Priority: 5
6. Recovery Plan Title: N/A
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: N/A
9. Recovery Objective/Criteria: N/A
10. Major Activity Since Last Report: None—believed extinct
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Virginia round-leaf birch 359

1. Species: Virginia round-leaf birch (*Betula uber*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Virginia Round-Leaf Birch Recovery Plan (First Revision)
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Rev/April, 1986
9. Recovery Objective/Criteria: Delist / Increase the number of *Betula uber* individuals to 1,000 in each of 10 populations.
10. Major Activity Since Last Report: Protection and monitoring of the original population. Establishment of additional populations. An extensive taxonomic study. Updating of the revised recovery plan has been completed.
11. Major Activity Over Next Reporting Period: Habitat protection and population monitoring.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Palmate-bracted bird's-beak 360

1. Species: Palmate-bracted bird's-beak (*Cordylanthus palmatus*)
2. Listing/Date: Endangered/July 1, 1986
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: None established as of yet, although some recovery actions have occurred.
10. Major Activity Since Last Report: City of Livermore and California Department of Fish and Game have worked with the Fish and Wildlife Service on securing the Livermore population, two new populations have been discovered on Service lands in the Sacramento Valley.
11. Major Activity Over Next Reporting Period: Further work on the Livermore situation.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

361 Salt marsh bird's-beak

1. Species: Salt marsh bird's-beak (*Cordylanthus maritimus* ssp. *maritimus*)
2. Listing/Date: Endangered/September 28, 1978
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 6
6. Recovery Plan Title: Salt Marsh Bird's-Beak Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/December 1985
9. Recovery Objective/Criteria: Protect 12 major marshes in the U.S. for a period of at least 10 years to secure self-maintaining populations.
10. Major Activity Since Last Report: Ensure protection of marshes where this plant species occurs or has previously occurred.
11. Major Activity Over Next Reporting Period: Continue protection of marshes.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

362 Small-anthered bittercress

1. Species: Small-anthered bittercress (*Cardamine micranthera*)
2. Listing/Date: Endangered/September 21, 1989
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Major land owners have been contacted regarding conservation easements or land acquisition; surveys of additional potential habitat have been conducted and existing populations monitored; two additional populations have been found and one known population has been extirpated.
11. Major Activity Over Next Reporting Period: Continuation of activities described under 10.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Dudley Bluffs bladderpod 363

1. Species: Dudley Bluffs bladderpod (*Lesquerella congesta*)
2. Listing/Date: Threatened/February 6, 1990
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 14
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Final listing was completed.
11. Major Activity Over Next Reporting Period: Conduct Section 7 consultations regarding the proposed Trans-Colorado pipeline and nahcolite mining activity.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Lyrate bladderpod 364

1. Species: Lyrate bladderpod (*Lesquerella lyrata*)
2. Listing/Date: Threatened/September 28, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Continue to make contact with private land owners to protect the species on private lands.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

365

Missouri bladderpod

1. Species: Missouri bladderpod (*Lesquerella filiformis*)
2. Listing/Date: Endangered/January 8, 1987
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Missouri Bladder-pod Recovery plan
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/April 7, 1988
9. Recovery Objective/Criteria: Delisting can be considered when 30 scattered self-sustaining populations are maintained for 7 years, and when 15 of these are in secure and protected ownership.
10. Major Activity Since Last Report: Additional surveys for sites were conducted in 1989 by the Missouri Department of Conservation. 13 new occurrences were found, bringing the total known occurrences to 69. Nine of the 69 sites are protected. The National Park Service has completed a contract research project that sets out some recommended management techniques on Wilson's Creek National Battlefield, which will enable the Park Service to restore some of the areas with bladder-pod and establish populations resistant to the invasion of exotics.
11. Major Activity Over Next Reporting Period: Continue pursuing protection of known sites, monitor selected areas, and continue searches for new sites.
12. Recovery Achieved: 2
13. Information Current as of: July 27, 1990

366

White bladderpod

1. Species: White bladderpod (*Lesquerella pallida*)
2. Listing/Date: Endangered/March 11, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Texas Bladderpod Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Stabilize
10. Major Activity Since Last Report: Texas Natural Heritage Program is doing a monitoring study with Sam Houston State University on this species. Shrubby species are encroaching in areas where white bladderpod occurs.
11. Major Activity Over Next Reporting Period: Report due on this years monitoring study.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

Ash Meadows blazingstar

367

1. Species: Ash Meadows blazingstar (*Mentzelia leucophylla*)
2. Listing/Date: Threatened/May 20, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish.

   Delisting—following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and four candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register. Monitoring of extant plant populations within Ash Meadows National Wildlife Refuge.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September, 1990

Heller's blazingstar

368

1. Species: Heller's blazingstar (*Liatris helleri*)
2. Listing/Date: Threatened/November 19, 1987
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Heller's Blazing Star
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/May 1, 1989
9. Recovery Objective/Criteria: Downlisting will be considered when the seven currently extant populations are protected and two additional populations have been found or reestablished; populations must be determined to be self-sustaining and permanently protected.
10. Major Activity Since Last Report: Major landowners have been contacted regarding conservation of the species on their lands; prescribed burning is being conducted at some Forest Service sites.
11. Major Activity Over Next Reporting Period: Continuation of activities in #10, as well as monitoring and population biology research.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

369 Scrub blazingstar

1. Species: Scrub blazingstar (*Liatris ohlingerae*)
2. Listing/Date: Endangered/July 27, 1989
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: Reclassification to threatened status can be considered when protection of a total of 5 sites, each with at least 1 population, is accomplished. For delisting, a total of at least 10 additional populations at 2 or more sites in Highlands or Polk Counties must be accomplished. A total of at least 3 sites must be in Highlands County, 3 in Polk.
10. Major Activity Since Last Report: Purchase of sites by the State and The Nature Conservancy has already made reclassification as threatened possible. Habitat acquisition by the Fish and Wildlife Service.
11. Major Activity Over Next Reporting Period: Further state and private habitat acquisition. Additional habitat acquisition by the Fish and Wildlife Service.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

370 Kearney's blue-star

1. Species: Kearney's blue-star (*Amsonia kearneyana*)
2. Listing/Date: Endangered/January 19, 1989
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U/draft due December 1990
9. Recovery Objective/Criteria: Stabilize/no Recovery Plan
10. Major Activity Since Last Report: Transplanted population has been monitored and supplemental water provided. The status of this population is now in question; recent flooding may have destroyed most plants.
11. Major Activity Over Next Reporting Period: No actions are anticipated
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Roan Mountain bluet

371

1. Species: Roan Mountain bluet (*Hedyotis purpurea* var. *montana*)
2. Listing/Date: Endangered/April 5, 1990
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 6
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Major landowners have been contacted regarding protection of the plant on their lands. Research has been initiated on population biology and habitat requirements.
11. Major Activity Over Next Reporting Period: Continuation of work in #10.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Florida bonamia

372

1. Species: Florida bonamia (*Bonamia grandiflora*)
2. Listing/Date: Threatened/November 2, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1989
9. Recovery Objective/Criteria: Delist when at least one site with viable populations is secured in Highlands County, Florida; two sites in Polk County; and at least one in a county within the plant's original range other than Marion.
10. Major Activity Since Last Report: U.S. Forest Service carried out a thorough inventory of the very large population in Ocala National Forest. The Nature Conservancy signed conservation agreements with Orange County and City of Orlando to protect two small populations. State Division of Forestry is preparing a management plan for recently-acquired Arbuckle State Forest with Nature Conservancy technical assistance. State is moving to purchase habitat at Saddle Blanket Lakes. Bok Tower Gardens has propagated the species.
11. Major Activity Over Next Reporting Period: More habitat purchase by State and Fish and Wildlife Service.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

373 Vahl's boxwood

1. Species: Vahl's boxwood (*Buxus vahlii*)
2. Listing/Date: Endangered/August 13, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Vahl's Boxwood (*Buxus vahlii*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 28, 1987
9. Recovery Objective/Criteria: Downlist. Reverse the decline and stabilize to self-sustaining condition by protecting existing populations and their habitats and by establishing new populations in the karst region of northwestern Puerto Rico.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 12, 1990

374 San Clemente Island broom

1. Species: San Clemente Island broom (*Lotus dendroideus* ssp. *traskiae*
2. Listing/Date: Endangered/August 11, 1977
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 9
6. Recovery Plan Title: California Channel Islands Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Eliminate threat from introduced pigs and goats.
10. Major Activity Since Last Report: Intensive efforts to eradicate feral goats and pigs continues.
11. Major Activity Over Next Reporting Period: Continue to remove feral animals.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Steamboat buckwheat 375

1. Species: Steamboat buckwheat (*Eriogonum ovalifolium* var. *williamsiae*)
2. Listing/Date: Endangered/July 8, 1986
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Proposed land exchange between private landowner and the Forest Service has fallen through.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Prairie bush-clover 376

1. Species: Prairie bush-clover (*Lespedeza leptostachya*)
2. Listing/Date: Threatened/January 9, 1987
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Prairie Bush-clover Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/October 6, 1988
9. Recovery Objective/Criteria: Delist when 20 viable naturally occurring populations within the core area are managed and protected, and 15 populations outside the core area are protected and managed.
10. Major Activity Since Last Report: Several new occurrences have been reported, bringing the total to 39. Eighteen of these are in public ownership; however, few have any type of management plan strictly for the bush clover.
11. Major Activity Over Next Reporting Period: Continue searches for new occurrences. A grazing research project and soil analysis survey will be undertaken in Iowa next year. Searches for new populations and monitoring will continue in Minnesota.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

377 San Clemente Island bush-mallow

1. Species: San Clemente Island bush-mallow (*Malacothamnus clementinus*)
2. Listing/Date: Endangered/August 11, 1977
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: California Channel Islands Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Eliminate threat from introduced goats and pigs.
10. Major Activity Since Last Report: Intensive efforts to eradicate feral goats and pigs continue.
11. Major Activity Over Next Reporting Period: Continued removal of feral animals.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

378 Autumn buttercup

1. Species: Autumn buttercup (*Ranunculus acriformis* var. *aestivalis*)
2. Listing/Date: Endangered/July 21, 1989
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Autumn Buttercup Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Under development
10. Major Activity Since Last Report: The species' only known habitat has been acquired by The Nature Conservancy. Intensive population monitoring has been conducted and a population increase to 34 plants has been documented. Control of competing vegetation in the species' habitat has been implemented. Four individual plants are in cultivation at an arboretum in Flagstaff, Arizona. The species remains critically endangered and may go extinct in the wild in the near future unless exceptional efforts are made for its preservation.
11. Major Activity Over Next Reporting Period: A draft recovery plan will be completed. Establishment of an additional population at Utah State University's arboretum is planned. Proposals to clone existing captive plants for captive propogation for use in research on biology and ecology of the species and for use in enhancing populations in the wild are being reviewed. Acquisition of the habitat purchased by the Nature Conservancy may be considered by the Service for eventual placement under the refuge system.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Mohr's Barbara's-button

379

1. Species: Mohr's Barbara's-button (*Marshallia mohrii*)
2. Listing/Date: Threatened/September 7, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Initiation of recovery plan development.
11. Major Activity Over Next Reporting Period: Recovery plan will be completed by September 1990. Anticipate contacting key landowners and encouraging their cooperation in protecting populations on their property.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Arizona hedgehog cactus

380

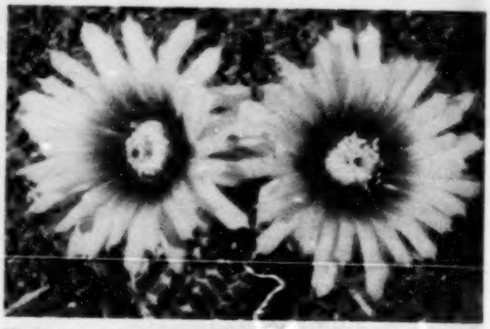
1. Species: Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*)
2. Listing/Date: Endangered/October 25, 1979
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U/draft due December 1990
9. Recovery Objective/Criteria: Downlist/No Recovery Plan
10. Major Activity Since Last Report: No actions taken in FY 90.
11. Major Activity Over Next Reporting Period: No actions are anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

381 Bakersfield cactus

1. Species: Bakersfield cactus (*Opuntia treleasei*)
2. Listing/Date: Endangered/July 19, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Metropolitan Bakersfield Habitat Conservation Plan proposes to "preserve" three cactus areas, if the Section 10(a) permit is issued.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

382 Black lace cactus

1. Species: Black lace cactus (*Echinocereus reichenbachii* var. *albertii*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Black-lace Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 18, 1987
9. Recovery Objective/Criteria: Unknown
10. Major Activity Since Last Report: Ray Emmett, Ph.D., has completed a seed bank study on this species. The Corpus Christi Botanical Garden is propagating this species from seed.
11. Major Activity Over Next Reporting Period: Unknown.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990



Black lace cacti are known only from three counties in Texas. Habitat loss during the clearing of land for livestock and illegal collecting are the main threats to this plant.

Brady pincushion cactus

383

1. Species: Brady pincushion cactus (*Pediocactus bradyi*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Brady Pincushion Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 28, 1986
9. Recovery Objective/Criteria: Downlist/Criteria not established.
10. Major Activity Since Last Report: Bureau of Land Management inventoried demographic monitoring plots. This action resulted in no net loss or gain to the species but allowed the BLM to assess threats and determine management direction.
11. Major Activity Over Next Reporting Period: BLM will continue inventorying monitoring plots.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Bunched cory cactus

384

1. Species: Bunched cory cactus (*Coryphantha ramillosa*)
2. Listing/Date: Threatened/November 6, 1979
3. Group: Plants
4. Species Status: Declining.
5. Recovery Priority: 8
6. Recovery Plan Title: Bunched Cory Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Repion 2
8. Recovery Plan Stage/Date: F/April 13, 1990
9. Recovery Objective/Criteria: Stabilize.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

385

Chisos Mountain hedgehog cactus

1. Species: Chisos Mountain hedgehog cactus (*Echinocereus chisosensis* var. *chisosensis*)
2. Listing/Date: Threatened/September 30, 1988
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 9
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

386

Cochise pincushion cactus

1. Species: Cochise pincushion cactus (*Coryphantha robbinsorum*)
2. Listing/Date: Threatened/January 9, 1986
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Demographic monitoring plots were inventoried in April. The purpose of monitoring is to identify threats to species and determine the best management strategy.
11. Major Activity Over Next Reporting Period: Same as #10.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Key tree-cactus 387

1. Species: Key tree-cactus (*Cereus robinii*)
2. Listing/Date: Endangered/July 19, 1984
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 5C
6. Recovery Plan Title: Key Tree-cactus Recovery Plan.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 9, 1986
9. Recovery Objective/Criteria: Reclassification to threatened possible when 10 self-sustaining sub-populations are established at secure sites in the Florida Keys.
10. Major Activity Since Last Report: Fish and Wildlife Service purchased a site with Key tree-cactus on Big Pine Key. Michael Hennessy (U.S. Department of Agriculture) researched pollination biology as part of a project to evaluate the need for pesticide restrictions in the Florida Keys. Effort by county to acquire part of the state park for a landfill fended off.
11. Major Activity Over Next Reporting Period: Hope to conduct taxonomic reevaluation of plants at Cactus Hammock site on Key Deer National Wildlife Refuge.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Knowlton cactus 388

1. Species: Knowlton cactus (*Pediocactus knowltonii*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Knowlton Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 30, 1984
9. Recovery Objective/Criteria: Delist. Restore habitat to carrying capacity of 100,000 plants; reintroduce cactii into two new areas. Protect plants from collecting and development impacts.
10. Major Activity Since Last Report: Monitoring continues at the type locality and population size was estimated with random sampling. Monitoring of the reintroduced population continues but no new plants are yet present in the population. The Bureau of Land Management has surveyed the Reese Canyon Research Natural Area (RNA) for potential reintroduction sites. The RNA was designed with the goal of using it for establishment of new populations.
11. Major Activity Over Next Reporting Period: Plan establishment of a second reintroduced population.
12. Recovery Achieved: 2
13. Information Current as of: July 27, 1990

389 Kuenzler hedgehog cactus

1. Species: Kuenzler hedgehog cactus (*Echinocereus fendleri* var. *kuenzleri*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Kuenzler Hedgehog Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 28, 1985
9. Recovery Objective/Criteria: Downlist. Secure and maintain a wild population of 5,000 plants.
10. Major Activity Since Last Report: New Mexico continues gathering data from monitoring plots on Fort Stanton. The Forest Service continues to monitor populations on the Lincoln National Forest. Pollinator studies are being conducted by U.S. Department of Agriculture.
11. Major Activity Over Next Reporting Period: Continued monitoring
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

390 Lee pincushion cactus

1. Species: Lee pincushion cactus (*Coryphantha sneedii* var. *leei*)
2. Listing/Date: Threatened/October 25, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 3
6. Recovery Plan Title: Sneed and Lee Pincushion Cacti Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 21, 1986
9. Recovery Objective/Criteria: Delist. Remove collecting threat, maintain stable population, and develop National Park Service (NPS) management plan.
10. Major Activity Since Last Report: The NPS continues surveying the monitoring plots it established at Carlsbad Caverns National Park.
11. Major Activity Over Next Reporting Period: Continued monitoring
12. Recovery Achieved: 2
13. Information Current as of: July 27, 1990

Lloyd's hedgehog cactus

391

. Species: Lloyd's hedgehog cactus (*Echinocereus lloydii*)

. Listing/Date: Endangered/October 26, 1979

. Group: Plants

. Species Status: Unknown

. Recovery Priority: 8

. Recovery Plan Title: NA

. Lead Region/Region Responsible for Recovery Plan: Region 2

. Recovery Plan Stage/Date: NA

. Recovery Objective/Criteria: Conduct status review. Now thought to be a naturally occurring hybrid. The Service is waiting for Dr. Allan D. Zimmerman to publish his work on this species.

10. Major Activity Since Last Report: None

11. Major Activity Over Next Reporting Period: Unknown

12. Recovery Achieved: 1

13. Information Current as of: July 26, 1990

Lloyd's Mariposa cactus

392

. Species: Lloyd's Mariposa cactus (*Neolloydia mariposensis*)

. Listing/Date: Threatened/November 6, 1979

. Group: Plants

. Species Status: Declining

. Recovery Priority: 2

. Recovery Plan Title: Lloyd's Mariposa Cactus Recovery Plan

. Lead Region/Region Responsible for Recovery Plan: Region 2

. Recovery Plan Stage/Date: F/April 13, 1990

. Recovery Objective/Criteria: Stabilize.

10. Major Activity Since Last Report: None

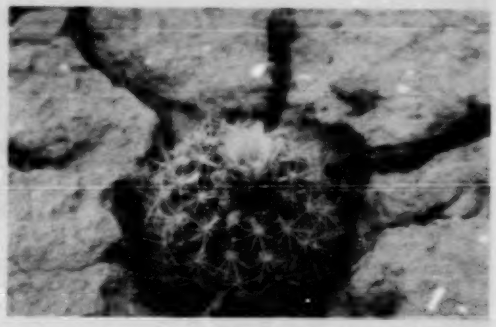
11. Major Activity Over Next Reporting Period: None anticipated

12. Recovery Achieved: 1

13. Information Current as of: July 26, 1990

393 Mesa Verde Cactus

1. Species: Mesa Verde Cactus (*Sclerocactus mesae-verdae*)
2. Listing/Date: Threatened/October 30, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8C
6. Recovery Plan Title: Mesa Verde Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/October 30, 1984
9. Recovery Objective/Criteria: Delist. Protect the five populations known at the time of listing from present and future human threats.
10. Major Activity Since Last Report: Monitoring continues by Bureau of Land Management (BLM), and the States of New Mexico and Colorado. Pollination biology is being studied by U.S. Department of Agriculture. The Hogback Area of Critical Environmental Concern has been designated by BLM primarily for the management of Mesa Verde cactus.
11. Major Activity Over Next Reporting Period: Continued monitoring



The main threats to the Mesa Verde cactus are removal by collectors and habitat disturbance due to human and livestock activities.

12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

394 Nellie cory cactus

1. Species: Nellie cory cactus (*Coryphantha minima*)
2. Listing/Date: Endangered/November 7, 1979
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Nellie Cory Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 20, 1984
9. Recovery Objective/Criteria: Stabilize.
10. Major Activity Since Last Report: Private landowner is currently denying Texas Natural Heritage Program access to this population.
11. Major Activity Over Next Reporting Period: Unknown at present.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

Nichol's Turk's head cactus

395

1. Species: Nichol's Turk's head cactus (*Echinocactus horizonthalonius* var. *nicholii*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: Nichol's Turk's Head Cactus
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/April 14, 1986
9. Recovery Objective/Criteria: Downlisting and delisting criteria not established.
10. Major Activity Since Last Report: The Bureau of Land Management inventoried demographic monitoring plots for this species.
11. Major Activity Over Next Reporting Period: No actions are anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Peebles Navajo cactus

396

1. Species: Peebles Navajo cactus (*Pediocactus peeblesianus* var. *peeblesianus*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: Peebles Navajo Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 30, 1984
9. Recovery Objective/Criteria: Delisting/Delisting criteria: Maintain, protect, and enhance both existing natural populations, increase number of individuals to 10,000, and curtail illegal collection.
10. Major Activity Since Last Report: A Fish and Wildlife Service contractor and the Bureau of Land Management inventoried the demographic monitoring plots for this species.
11. Major Activity Over Next Reporting Period: Same as #10.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

397 San Rafael cactus

1. Species: San Rafael cactus (*Pediocactus despainii*)
2. Listing/Date: Endangered/September 16, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: One of the species' two populations experienced continued habitat degradation from off-road vehicle use. Population monitoring was begun and a third population was discovered through habitat inventories. Because of limited habitat distribution, the species is probably not recoverable, but is protectable.
11. Major Activity Over Next Reporting Period: Habitat inventories and population monitoring will continue for the purpose of discovering additional populations and determining the status of known populations. The potential for initiation of a horticultural propagation effort will be analyzed. Development of a recovery plan will be deferred until a listing package for a closely related candidate species is completed.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

398 Siler pincushion cactus

1. Species: Siler pincushion cactus (*Pediocactus sileri*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Siler Pincushion Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/April 14, 1986
9. Recovery Objective/Criteria: Downlist/Five downlisting criteria include developing management plan, developing mineral feasibility reports, censusing and mapping populations, administering mining claims, and establishing and inventorying monitoring plots. Delisting criteria include implementation of management plan, demonstrate long-term stability of populations, and assure protection from new mining claims.
10. Major Activity Since Last Report: Bureau of Land Management (BLM) inventoried demographic monitoring plots. This action resulted in no net loss or gain to the species but allowed the BLM to assess threats and determine management direction.
11. Major Activity Over Next Reporting Period: Same as above.
12. Recovery Achieved: 2
13. Information Current as of: July 25, 1990

Sneed pincushion cactus

399

1. Species: Sneed pincushion cactus (*Coryphantha sneedii* var. *sneedii*)
2. Listing/Date: Endangered/November 7, 1979
3. Group: Plants
4. Species Status: Declining (several populations in Lincoln National Forest were destroyed by a major fire)
5. Recovery Priority: 9
6. Recovery Plan Title: Sneed and Lee Pincushion Cacti Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 21, 1986
9. Recovery Objective/Criteria: Potential downlist/Charlie McDonald is leading the Sneed pincushion monitoring program for Region 2. Two years of work have not located large, extensive populations of this species; therefore, there is a need for ongoing monitoring to determine population trends/threats over time.
10. Major Activity Since Last Report: Field monitoring of known locations in New Mexico.
11. Major Activity Over Next Reporting Period: Populations in Texas and near El Paso City need to be monitored.
12. Recovery Achieved: 2
13. Information Current as of: July 26, 1990

Spineless hedgehog cactus

400

1. Species: Spineless hedgehog cactus (*Echinocereus triglochidiatus* var. *inermis*)
2. Listing/Date: Endangered/November 7, 1979
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 9
6. Recovery Plan Title: Spineless Hedgehog Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/April 2, 1986
9. Recovery Objective/Criteria: Downlist—secure 20 populations unknown to collectors with 2,000 plants per population. Delist—secure 35 such populations.
10. Major Activity Since Last Report: In 1988 the Utah Interagency Rare Plant Group recommended delisting based on invalid taxonomy. Taxonomy validity remains questionable and delisting may be appropriate.
11. Major Activity Over Next Reporting Period: Delist if taxonomy is invalid.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

401 Tobusch fishhook cactus

1. Species: Tobusch fishhook cactus (*Ancistrocactus tobuschii*)
2. Listing/Date: Endangered/November 7, 1979
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Tobusch Fishhook Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 18, 1987
9. Recovery Objective/Criteria: Potential downlist/several new populations and locations have been found within the last 2 years, suggesting that this species may be more abundant and have a wider range than previously thought. Continue to monitor existing populations and inventory additional habitat.
10. Major Activity Since Last Report: Ray Emmett, Ph.D., completed a reproductive biology study of species for FY 90. This study will provide information about pollination vectors, seed germination, and population demography.
11. Major Activity Over Next Reporting Period: Unknown at present.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

402 Uinta Basin hookless cactus

1. Species: Uinta Basin hookless cactus (*Sclerocactus glaucus*)
2. Listing/Date: Threatened/October 11, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Uinta Basin Hookless Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/September 1990
9. Recovery Objective/Criteria: Delisting—Document a total population of 30,000 individuals in 6 separate populations of at least 2,000 individuals each, 4 of which must be on lands with formal management designations providing long-term, undisturbed habitat. Special conservation measures for populations and habitats of morphologically distinct forms will be needed, if justified by taxonomic evaluations.
10. Major Activity Since Last Report: The agency/public draft of the recovery plan was completed in May 1990. Compilation of field data on species distribution and abundance on Bureau of Land Management lands was initiated.
11. Major Activity Over Next Reporting Period: Compilation of data on species abundance will be completed in FY 91 or 92. Possibility of delisting will be evaluated based on new information on species abundance.
12. Recovery Achieved: 3
13. Information Current as of: September 1990

Wright fishhook cactus 403

1. Species: Wright fishhook cactus (*Sclerocactus wrightiae*)
2. Listing/Date: Endangered/October 11, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Wright Fishhook Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/December 24, 1985
9. Recovery Objective/Criteria: Eligible for downlisting when 2 self-sustaining populations of at least 10,000 individuals over 2 areas which are considered essential habitat are secured. Eligible for delisting when a third such population is secured.
10. Major Activity Since Last Report: Population and habitat monitoring studies are being conducted. The Bureau of Land Management and the National Park Service have incorporated habitat protection measures for this species into their land use planning documents.
11. Major Activity Over Next Reporting Period: Population and habitat inventories have identified a greater abundance, range distribution, and additional populations of this species than originally known. Evaluation will be undertaken to consider delisting.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Cassia mirabilis (No common name) 404

1. Species: No common name (*Cassia mirabilis*)
2. Listing/Date: Endangered/April 5, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

405

Spring-loving centaury

1. Species: Spring-loving centaury (*Centaurium namophilum*)
2. Listing/Date: Threatened/May 20, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish.

   Delisting—following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and four candidate plant species at all sites which they have historically occupied.

Known only from Ash Meadows, Nevada, the spring-loving centaury requires, as the name suggests, moist areas. Many of the remaining individuals are found on the Ash Meadows National Wildlife Refuge, a unique desert wetland ecosystem established to conserve the centaury and 11 other listed plants and animals.

10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register. Monitoring of extant plant populations within Ash Meadows National Wildlife Refuge.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September, 1990

Pedate checker-mallow 406

1. Species: Pedate checker-mallow (*Sidalcea pedata*)
2. Listing/Date: Endangered/August 31, 1984
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/FY 91
9. Recovery Objective/Criteria: This species occurs within only 5 locales greater than one acre in size. These 5 areas total approximately 30 acres. The primary recovery objective is to preserve 5 locations and expand the population into several hundred additional acres of wet meadows.
10. Major Activity Since Last Report: No recovery activity. Consultations to preserve remaining habitat have been completed.
11. Major Activity Over Next Reporting Period: Prepare a recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Higo chumbo 407

1. Species: Higo chumbo (*Harrisia (-Cereus) portoricensis*)
2. Listing/Date: Threatened/August 8, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Complete the recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

408 Robbins' cinquefoil

1. Species: Robbins' cinquefoil (*Potentilla robbinsiana*)
2. Listing/Date: Endangered/September 17, 1980
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Robbins' Cinquefoil (*Potentilla robbinsiana*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/July 22, 1983
9. Recovery Objective/Criteria: Downlist / Protect the existing colony of *Potentilla robbinsiana* in its entirety, encourage its natural expansion, and establish self-sustaining, reproducing populations in at least four identified potential habitats not presently occupied.
10. Major Activity Since Last Report: Monitoring of the original colony and establishment of two additional colonies. Plant propagation. Habitat protection, including relocation of foot trails that passed through the site of the major colony. Habitat protection. The major colony is stable; the established colonies have not yet produced seedlings.
11. Major Activity Over Next Reporting Period: The recovery plan will be updated, and reclassification of the species will be investigated pending successful reproduction in the established colonies. Current recovery activities mentioned above will continue.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

409 Arizona cliff-rose

1. Species: Arizona cliff-rose (*Cowania subintegra*)
2. Listing/Date: Endangered/May 29, 1984
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U/draft due December 1990
9. Recovery Objective/Criteria: Downlist/No Recovery Plan
10. Major Activity Since Last Report: Bureau of Land Management (BLM) inventoried monitoring plots to determine grazing effects. This action resulted in no change in population levels but the information that was gathered supported the BLM effort to build a fence that excludes cattle and burros. The enclosure, built last fiscal year, will reduce grazing pressure on these plants and will allow reproduction to occur.
11. Major Activity Over Next Reporting Period: BLM will continue inventorying the monitoring plots to determine the success of the fenced exclosure.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Running buffalo-clover

410

1. Species: Running buffalo-clover (*Trifolium stoloniferum*)
2. Listing/Date: Endangered/June 5, 1987
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 2
6. Recovery Plan Title: Running Buffalo-Clover Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/June 8, 1989
9. Recovery Objective/Criteria: Downlist to threatened when 30 secure self-sustaining populations are known, and we have adequate biological information to fully understand the plant. Delisting can be undertaken when additional populations are protected.
10. Major Activity Since Last Report: One new population was discovered in West Virginia. At the time of listing in 1987, only one population was known. We now are aware of 18 populations.
11. Major Activity Over Next Reporting Period: Continue to search for new populations, and monitor existing ones. Missouri Department of Conservation intends to reintroduce plants in at least one historic site, using stock from the Missouri Botanical Garden, a Center for Plant Conservation member.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

Tennessee purple coneflower

411

1. Species: Tennessee purple coneflower (*Echinacea tennesseensis*)
2. Listing/Date: Endangered/June 6, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Tennessee Coneflower Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/F/November 14, 1989
9. Recovery Objective/Criteria: Delist when five populations with three self-sustaining colonies each are protected
10. Major Activity Since Last Report: Material from all colonies is being maintained in cultivation, state-owned colonies have received protective zoning, life history studies have been completed, studies on management requirements of species have been initiated
11. Major Activity Over Next Reporting Period: Continuation of management requirements studies
12. Recovery Achieved: 2
13. Information Current as of: June 25, 1990

Tennessee purple coneflowers are now under cultivation at the Tennessee Valley Authority Nursery. Botanical facilities in Nashville and local citizens are participating in the efforts.

412 Loch Lomond coyote-thistle

1. Species: Loch Lomond coyote-thistle (*Eryngium constancei*)
2. Listing/Date: Endangered/August 1, 1985
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 14
6. Recovery Plan Title: N/A
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: N/A
9. Recovery Objective/Criteria: Acquire and protectively fence only known population, recontour vernal lake bed, and reseed lake bed.
10. Major Activity Since Last Report: Land owned and managed by California Department of Fish and Game was fenced with Section 6 money and population enhanced in the disturbed portion of the lake.
11. Major Activity Over Next Reporting Period: Likely to initiate a delisting package soon.
12. Recovery Achieved: 4
13. Information Current as of: August 23, 1990

413 Toad-flax cress

1. Species: Toad-flax cress (*Glaucocarpum suffrutescens*)
2. Listing/Date: Endangered/October 6, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 10C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: The Bureau of Land Management has incorporated protection measures for this species' habitat into its land use planning documents. Recent taxonomic analyses have verified the validity of the species taxonomic classification.
11. Major Activity Over Next Reporting Period: The species was historically affected by livestock grazing, however habitat disturbance from energy development is seen as a major future threat. Population monitoring will begin to document the population status in the face of future threats. Recovery of this species may be covered in a joint recovery plan after other candidate members of the species' genus are listed.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Jones cycladenia 414

1. Species: Jones cycladenia (*Cycladenia humilis* var. *jonesii*)
2. Listing/Date: Threatened/May 5, 1986
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: The U.S. Department of Agriculture's Bee Biology Laboratory has begun research in pollination biology of this species. Population monitoring studies have begun. Threats to this species come from habitat disturbance from mining and secondarily from off-road vehicle use. As long as the habitat is protected, the species should remain stable.
11. Major Activity Over Next Reporting Period: Development of a recovery plan is proposed. Monitoring of population status and external disturbance factors will continue.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Santa Cruz cypress 415

1. Species: Santa Cruz cypress (*Cupressus abramsiana*)
2. Listing/Date: Endangered/January 8, 1987
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

416 Lakeside daisy

1. Species: Lakeside daisy (*Hymenoxys acaulis* var. *glabra*)
2. Listing/Date: Threatened/June 23, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for the Lakeside Daisy
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/September 19, 1990
9. Recovery Objective/Criteria: Maintain and protect 475 acres on the Marblehead area, and two geographically distinct introduced populations for 10-plus years.
10. Major Activity Since Last Report: Plants have been introduced into three areas. Recovery plan is being written. The State of Ohio has acquired 19 acres of prime habitat on the Marblehead Peninsula with good healthy population of daisy. Monitoring of introduced populations has been initiated.
11. Major Activity Over Next Reporting Period: Continue monitoring.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

417 Maguire daisy

1. Species: Maguire daisy (*Erigeron maguirei* var. *maguirei*)
2. Listing/Date: Endangered/September 5, 1985
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 6
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: NA
10. Major Activity Since Last Report: The National Park Service has initiated an inventory for this species in Capitol Reef National Park. The Fish and Wildlife Service is monitoring the species on Bureau of Land Management (BLM) lands. BLM has found additional populations in the San Rafael Swell. Taxonomic studies have been completed indicating that *Erigeron maguirei* var. *maguirei* and *Erigeron maguirei* var. *harrisonii* are the same entity. The species should now be recognized as *Erigeron maguirei* without taxonomic varieties.
11. Major Activity Over Next Reporting Period: Inventories of population abundance and habitat distribution will continue and the resulting data will be analyzed for abundance and vigor of the species to determine if the species can be considered for delisting. This may preclude the need for development of a recovery plan.
12. Recovery Achieved: 4
13. Information Current as of: July 1990

Daphnopsis hellerana (No common name) 418

Species: No common name (*Daphnopsis hellerana*)

Listing/Date: Endangered/June 23, 1988

Group: Plants

Species Status: Declining

Recovery Priority: 5

Recovery Plan Title: *Cornutia obovata* and *Daphnopsis hellerana* Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: A/April 1990

9. Recovery Objective/Criteria: Delisting/To establish three additional populations of each species in protected areas such as the Commonwealth Forest Reserves. Privately-owned population sites should be protected.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Texas prairie dawn-flower 419

Species: Texas prairie dawn-flower (=Texas bitterweed) (*Hymenoxys texana*)

Listing/Date: Endangered/March 13, 1986

Group: Plants

Species Status: Declining

Recovery Priority: 8C

Recovery Plan Title: *Hymenoxys texana* Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 2

Recovery Plan Stage/Date: F/April 13, 1990

9. Recovery Objective/Criteria: Stabilize. Downlisting may be considered when 50 separate populations, each at least one hectare in size, are discovered or established and protected from adverse land use practices or modifications.
10. Major Activity Since Last Report: Final recovery plan was signed, printed, and distributed to interested parties. No new populations were discovered this year. One population of about 500 individuals was lost due to road construction. Several hundred individuals remain under artificial propagation at the Mercer Arboretum of Houston, Texas. Good reproduction, survival, and growth of the plant is being observed.
11. Major Activity Over Next Reporting Period: Searches will be made of potential habitat areas as time and money allows. The species will continue to be propagated at Mercer.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

420 Ashy dogweed

1. Species: Ashy dogweed (*Thymophylla tephroleuca*)
2. Listing/Date: Endangered/July 19, 1984
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Ashy Dogweed Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/July 29, 1987
9. Recovery Objective/Criteria: Stabilize.
10. Major Activity Since Last Report: The National Wildflower Research Center (NWRC) in Austin, Texas, collected seed of ashy dogweed and is doing a seed germination study under a Section 6 Cooperative Agreement with the Texas Natural Heritage Program. The NWRC had trouble getting seeds to germinate this year and wants to collect more seed.
11. Major Activity Over Next Reporting Period: Continuation of NWRC seed germination study.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

421 Canby's dropwort

1. Species: Canby's dropwort (*Oxypolis canbyi*)
2. Listing/Date: Endangered/February 25, 1986
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for Canby's Dropwort
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 10, 1990
9. Recovery Objective/Criteria: Downlisting can be considered when 14 of the extant populations are protected from habitat destruction and 5 additional populations have been found, reestablished, or (in the case of populations that are now marginal) augmented to the point where they can be self-sustaining; all 19 populations needed for recovery must be determined to be self-sustaining and permanently protected.
10. Major Activity Since Last Report: Surveys have been conducted in suitable habitat for additional populations, the most important existing populations are being monitored, research is currently ongoing on the biology of the species, and two of the remaining three plants in the last surviving Delaware population have been taken into cultivation due to that population's precipitous decline.
11. Major Activity Over Next Reporting Period: Continuation of activities described in #10, as well as investigation of management needs at key sites.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Erubia 422

Species: Erubia (*Solanum drymophilium*)

Listing/Date: Endangered/August 26, 1988

Group: Plants

Species Status: Declining

Recovery Priority: 2C

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: U

Recovery Objective/Criteria: To be developed.

10. Major Activity Since Last Report: Post hurricane assessment was conducted in Cayey.

11. Major Activity Over Next Reporting Period: None anticipated.

12. Recovery Achieved: 1

13. Information Current as of: July 12, 1990

Garber's spurge 423

Species: Garber's spurge (*Chamaesyce garberi*)

Listing/Date: Threatened/July 18, 1985

Group: Plants

Species Status: Stable.

Recovery Priority: 8

Recovery Plan Title: Recovery plan for Five Pine Rockland Plant Species.

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: F/October 7, 1988

Recovery Objective/Criteria: *Chamaesyce garberi* could be considered for delisting if 20 self-sustaining populations were secured.

10. Major Activity Since Last Report: None

11. Major Activity Over Next Reporting Period: None anticipated

12. Recovery Achieved: 1

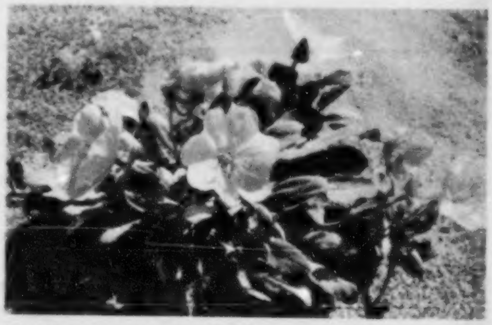
13. Information Current as of: July 1990

424
Antioch Dunes evening-primrose

1. Species: Antioch Dunes evening-primrose (*Oenothera deltoides* ssp. *howellii*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for Three Endangered Species Endemic to Antioch Dunes, California
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/April 25, 1984
9. Recovery Objective/Criteria: Downlist when known population is stabilized and an undetermined number of populations are established.
10. Major Activity Since Last Report: Evening-primrose on refuge has been monitored and autecological studies have been undertaken using Section 6 monies.
11. Major Activity Over Next Reporting Period: Continuation of #10.
12. Recovery Achieved: 2
13. Information Current as of: July 17, 1990

425
Eureka Valley evening-primrose

1. Species: Eureka Valley evening-primrose (*Oenothera avita* ssp. *eurekensis*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Eureka Valley Dunes Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/December 13, 1982
9. Recovery Objective/Criteria: Stabilize population by eliminating impacts from off-road vehicles
10. Major Activity Since Last Report: The Bureau of Land Management (BLM) monitored permanent transects in 1988 that were originally established in 1985. Analysis of the data has not been completed. An interagency meeting (California Department of Fish & Game, Bureau of Land Management, FWS, Inyo County, California National Park Service) convened to discuss concerns over the encroachment of Russian thistle onto the Eureka Dunes evening primrose habitat.



The Eureka Valley evening-primrose is extremely sensitive to disturbance and is particularly vulnerable to off-road vehicles. The Fish and Wildlife Service is working with the Bureau of Land Management to protect the habitat of the species.

11. Major Activity Over Next Reporting Period: If funding is available: 1) assist BLM in completing data analysis of permanent transects 2) Set up transects to determine whether the encroachment of Russian thistle is a threat to the species.
12. Recovery Achieved: 2
13. Information Current as of: August 8, 1990

San Benito evening-primrose

426

1. Species: San Benito evening-primrose (*Camissonia benitensis*)
2. Listing/Date: Threatened/February 12, 1985
3. Group: Plants
4. Species Status: Unknown (temporarily declining due to drought conditions)
5. Recovery Priority: 5C
6. Recovery Plan Title: San Benito Evening-Primrose Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Agency/June 27, 1988
9. Recovery Objective/Criteria: Secure and manage all known suitable populations of the species along Clear Creek by enhancing or restoring all habitat.
10. Major Activity Since Last Report: The Bureau of Land Management contracted out annual population monitoring activities for this species.
11. Major Activity Over Next Reporting Period: A final year of monitoring will be conducted in 1991. Finalize the Draft Recovery Plan.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Aleutian shield-fern

427

1. Species: Aleutian shield-fern (*Polystichum aleuticum*)
2. Listing/Date: Endangered/February 17, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 7
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: The population on Mt. Reed, island of Adak, Alaska, was mapped, and permanent monitoring plots established. Soil samples collected for analyses. Propagation experiments initiated and first in vitro production of sporophyte accomplished. Surveys for previously known population on Atka, and others yet undiscovered.
11. Major Activity Over Next Reporting Period: Continuation of propagation experiments to collect data on life history and causes of rarity. Continuation of surveys for undiscovered populations. Collection of all available information to be used in determination of feasibility of appointing a recovery team and preparing a recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

428 American hart's-tongue fern

1. Species: American hart's-tongue fern (***Phyllitis scolopendrium*** var. ***americana***)
2. Listing/Date: Threatened/July 14, 1989
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for American Hart's-tongue Fern
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: T/May 1990
9. Recovery Objective/Criteria: To delist the species by protecting at least 13 self-sustaining populations in the U. S. (2 in AL, 2 in TN, 3 in MI, and 6 in NY)
10. Major Activity Since Last Report: Preparation and distribution of the technical draft recovery plan.
11. Major Activity Over Next Reporting Period: Preparation and distribution of the agency draft and final recovery plans for the species
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

429 Elfin tree fern

1. Species: Elfin tree fern (*Cyathea dryopteroides*)
2. Listing/Date: Endangered/June 16, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Ilex cooki and *Cyathea dryopteroides* Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/1990
9. Recovery Objective/Criteria: Downlist/Stabilize the species to a self-sustaining status when at least two new populations of each species capable of self-perpetuation have been established within protected units of the Commonwealth Forest Reserves or on Federal land within the Caribbean National Forest.
10. Major Activity Since Last Report: None specified.
11. Major Activity Over Next Reporting Period: None specified.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Large-flowered fiddleneck

430

1. Species: Large-flowered fiddleneck (*Amsinckia grandiflora*)
2. Listing/Date: Endangered/May 8, 1985
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for Large-flowered Fiddleneck
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A/June 18, 1987
9. Recovery Objective/Criteria: Downlist when known populations secure with 2,500 plants and at least 4 new populations are established for 10 consecutive years
10. Major Activity Since Last Report: New population discovered, and one new population introduced and monitored.
11. Major Activity Over Next Reporting Period: A second population will be introduced
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

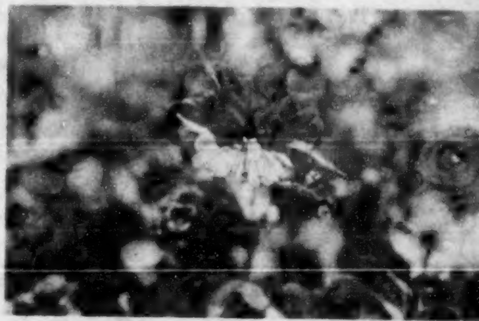
Zuni (rhizome) fleabane

431

1. Species: Zuni (rhizome) fleabane (*Erigeron rhizomatus*)
2. Listing/Date: Threatened/April 26, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Zuni Fleabane Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 30, 1988
9. Recovery Objective/Criteria: Delist. Survey all potential habitat, establish permanent monitoring, and implement a management plan. Demonstrate long-term population stability.
10. Major Activity Since Last Report: Monitoring continues in the State study plots. The U.S. Department of Agriculture has studied pollination. The Bureau of Land Management designated the Sawtooth Area of Critical Environmental Concern primarily for management of Zuni fleabane.
11. Major Activity Over Next Reporting Period: Surveys will be conducted in the Sawtooth Mountains to locate new populations.
12. Recovery Achieved: 2
13. Information Current as of: July 27, 1990

432 MacFarlane's four-o'clock

1. Species: MacFarlane's four-o'clock (*Mirabilis macfarlanei*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 2
6. Recovery Plan Title: MacFarlane's Four O'Clock Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/March 27, 1985
9. Recovery Objective/Criteria: Species may be considered recovered when a total of 10 colonies (5 colonies, or any combinations of 10, in each of 2 geographically distinct and isolated populations) are protected and managed to assure their continued existence.
10. Major Activity Since Last Report: Searched potential habitats for more plants; continued sampling and monitoring; allelopathic studies; collect propagules; insect studies continued; outplantings of rhizome materials; seed viability studies.
11. Major Activity Over Next Reporting Period: Monitoring; allelopathic activities; search potential habitats for more plants; propagule collecting; seed viability; tissue culture activity.



Thought to be extinct, MacFarlane's four-o'clock was rediscovered in 1977. It is now known only from two populations in northwest Oregon and west-central Idaho.

12. Recovery Achieved: 2
13. Information Current as of: July 16, 1990

433 Johnston's frankenia

1. Species: Johnston's frankenia (*Frankenia johnstonii*)
2. Listing/Date: Endangered/August 7, 1984
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 5
6. Recovery Plan Title: Johnston's Frankenia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/May 24, 1988
9. Recovery Objective/Criteria: Downlist or delist. (New populations have been found in the lower Rio Grande valley and this species now appears to be more abundant and widespread than previously thought.)
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

Hawaiian gardenia

434

1. Species: Hawaiian gardenia (= na'u) (*Gardenia brighamii*)
2. Listing/Date: Endangered/August 21, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: The State constructed two enclosures around two known wild trees on Oahu for protection and regeneration purposes. The State plans to plant seedlings, maintain the enclosure and water delivery system, and monitor the plants on Molokai. A fence was also constructed to protect the two known remaining trees on Molokai.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Geocarpon

435

1. Species: Geocarpon (*Geocarpon minimum*)
2. Listing/Date: Threatened/June 16, 1987
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 13
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: A new population was discovered in Louisiana through surveys by the Louisiana Heritage Program. Arkansas and Missouri are continuing to monitor populations in their States.
11. Major Activity Over Next Reporting Period: Emphasis will be placed on the development of the recovery plan. Additional surveys will be conducted in Louisiana, if funding becomes available.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

436 Sandplain gerardia

1. Species: Sandplain gerardia *(Agalinis acuta)*
2. Listing/Date: Endangered/September 7, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 5C
6. Recovery Plan Title: Sandplain Gerardia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/September 20, 1989
9. Recovery Objective/Criteria: Downlist / (1) 20 stable, wild populations; (2) 15 sites on protected land; (3) technology developed for seed propagation and storage.
10. Major Activity Since Last Report: Habitat protection through landowner contacts and an effort to transfer a key sandplain gerardia site to the National Wildlife Refuge System through Government Services Administration. Establishment of a seed bank and plant cultivation. Life history studies. Site-specific soil analyses to determine natural limiting factors.
11. Major Activity Over Next Reporting Period: Continued population and habitat monitoring. A controlled burn study. Closer contacts with landowners.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

437 Tumamoc globeberry

1. Species: Tumamoc globeberry *(Tumamoca macdougalii)*
2. Listing/Date: Endangered/April 26, 1986
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 1
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be determined.
10. Major Activity Since Last Report: The Bureau of Reclamation purchased two parcels of land and payed for a survey for the species in the U.S. and Mexico. These two actions were required by a biological opinion issued in 1986 for the Central Arizona Project Canal. Bureau of Land Management (BLM) inventoried demographic monitoring plots. This action resulted in no net loss or gain to the species but allowed the BLM to assess threats and determine management direction.
11. Major Activity Over Next Reporting Period: BLM will continue monitoring. Surveys are being conducted by BLM and other agencies for the purposes of Section 7 consultation.
12. Recovery Achieved: 1
13. Information Current as of: July 25, 1990

Beautiful goetzea

438

1. Species: Beautiful goetzea (matabuey) (*Goetzea elegans*)
2. Listing/Date: Endangered/April 19, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Beautiful Goetzea (*Goetzea elegans*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 18, 1987
9. Recovery Objective/Criteria: Downlist. Reverse the decline and stabilize to self-sustaining condition by protecting existing populations and their habitats and establishing new populations at other protected sites in northern Puerto Rico.
10. Major Activity Since Last Report: Research project has been conducted by a graduate student.
11. Major Activity Over Next Reporting Period: None specified
12. Recovery Achieved: 1
13. Information Current as of: July 12, 1990

Blue Ridge goldenrod

439

1. Species: Blue Ridge goldenrod (*Solidago spithamaea*)
2. Listing/Date: Threatened/March 28, 1985
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for the Blue Ridge Goldenrod
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 28, 1987
9. Recovery Objective/Criteria: Downlisting can be considered when the three extant populations have been protected and two additional populations have been found or reestablished; populations must be determined to be self-sustaining.
10. Major Activity Since Last Report: All landowners have been contacted regarding protection of the species on their lands; barriers to prevent trampling have been constructed on the U.S. Forest Service site; research is being conducted by volunteers on population biology and habitat requirements.
11. Major Activity Over Next Reporting Period: Continuation of activities in #10, as well as monitoring and expanded research into habitat and management needs.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

440

Houghton's goldenrod

1. Species: Houghton's goldenrod (*Solidago houghtonii*)
2. Listing/Date: Threatened/July 18, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Houghton's Goldenrod (*Solidago houghtonii*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: T/March 1, 1989
9. Recovery Objective/Criteria: Delist. Agency draft will contain measurable recovery criteria.
10. Major Activity Since Last Report: Recovery plan is being prepared under contract. Michigan Department of Natural Resources is initiating a landowner contact program, and continues to search for new populations.
11. Major Activity Over Next Reporting Period: Complete the recovery plan; continue landowner contacts, and searches for new populations.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

441

Short's goldenrod

1. Species: Short's goldenrod (*Solidago shortii*)
2. Listing/Date: Endangered/September 5, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Short's Goldenrod Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/May 25, 1988
9. Recovery Objective/Criteria: To delist the species by providing permanent protection to 18 viable occurrences, including the 9 currently known occurrences near Blue Licks State Park.
10. Major Activity Since Last Report: Searched for new populations, prioritized known occurrences for protection, studied life history and habitat requirements, initiated long term demographic study, initiated study of species management requirements, and The Nature Conservancy purchased and protected one population
11. Major Activity Over Next Reporting Period: Continue protection efforts, continue demographic studies, and continue study of management requirements
12. Recovery Achieved: 2
13. Information Current as of: June 26, 1990

White-haired goldenrod 442

1. Species: White-haired goldenrod (*Solidago albopilosa*)
2. Listing/Date: Threatened/April 7, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To delist the species; recovery criteria have not been established yet
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

Miccosukee gooseberry 443

1. Species: Miccosukee gooseberry (*Ribes echinellum*)
2. Listing/Date: Threatened/July 18, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 14
6. Recovery Plan Title: NA
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: NA
9. Recovery Objective/Criteria: Stabilize. Both known populations are secure, but this remains a very rare plant.
10. Major Activity Since Last Report: The two sites on which this species occurs are adequately protected. The one site in South Carolina is owned and managed by that State. The other site in Florida is privately owned and managed with an agreement with The Nature Conservancy.
11. Major Activity Over Next Reporting Period: What appears to be a reliable report of the plant on the right of way of Interstate 10 in Gadsden County, Florida needs to be confirmed.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

444 Hillebrand's gouania

1. Species: Hillebrand's gouania (*Gouania hillebrandii*)
2. Listing/Date: Endangered/November 9, 1984
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: *Gouania Hillebrandii* Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/July 16, 1990
9. Recovery Objective/Criteria: Remove threats from cattle grazing and insect infestations, and increase each of the two populations to at least 500 reproductive plants for downlisting. When 5 populations of 500 reproductive plants each have become established for 10 years, the species may be delisted.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

445 Eureka Valley dune-grass

1. Species: Eureka Valley dune-grass (*Swallenia alexandrae*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 7
6. Recovery Plan Title: Eureka Valley Dunes Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/December 13, 1982
9. Recovery Objective/Criteria: Stabilize population by eliminating impacts from off-road vehicles
10. Major Activity Since Last Report: The Bureau of Land Management monitored permanent transects in 1988 that were originally established in 1985. Analysis of the data has not been completed. Off-road vehicle traffic was significantly reduced in the early 1980's with the construction of vehicle barriers at the base of the dunes, though occasional infractions continue.
11. Major Activity Over Next Reporting Period: The permanent transects should be monitored again in 1991.
12. Recovery Achieved: 2
13. Information Current as of: August 8, 1990

Solano grass 446

1. Species: Solano grass (*Tuctoria mucronata*)
2. Listing/Date: Endangered/September 28, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Delta Green Ground Beetle and Solano Grass Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 11, 1985
9. Recovery Objective/Criteria: Downlist when 2 populations grow within 2 vernal pools for 10 years; delist when 3 populations grow within 2 vernal pools for 15 years.
10. Major Activity Since Last Report: Entire population is on California Nature Conservancy lands and is being managed as a Nature Conservancy preserve.
11. Major Activity Over Next Reporting Period: Continued management and monitoring by the Nature Conservancy.
12. Recovery Achieved: 3
13. Information Current as of: July 17, 1990

San Francisco Peaks groundsel 447

1. Species: San Francisco Peaks groundsel (*Senecio franciscanus*)
2. Listing/Date: Threatened/November 22, 1983
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: San Francisco Peaks Groundsel Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/October 5, 1987
9. Recovery Objective/Criteria: Delist/Delisting criteria include demonstrated long-term stability of populations and habitat, implementation of Alpine Tundra Management Plan, improvement of the trail system, and development of cooperative agreement between the Forest Service and the Fish and Wildlife Service on monitoring and enforcement of closure. Short-term objective is to downlist.
10. Major Activity Since Last Report: Forest Service has drafted the Kachina Peaks Wilderness Plan (Plan). The Plan sets forth management criteria for the Wilderness Area, including the alpine area that is the habitat for San Francisco Peaks groundsel.
11. Major Activity Over Next Reporting Period: Forest Service plans to build trails and better manage visitor traffic through the habitat.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

448

Ash Meadows gumplant

1. Species: Ash Meadows gumplant (*Grindelia fraxinopratensis*)
2. Listing/Date: Threatened/May 20, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following conditions met within essential habitat for a period of five years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish. Delisting—following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and four candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register. Monitoring of extant plant populations within Ash Meadows National Wildlife Refuge.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September 1990

449

Narrow-leaved haplostachya

1. Species: Narrow-leaved haplostachya (*Haplostachys haplostachya* var. *angustifolia*)
2. Listing/Date: Endangered/October 30, 1979
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 4
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: The State of Hawaii plans to construct an enclosure to protect plants at the Pohakuloa Training Area from herbivores.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Harperella 450

Species: Harperella (*Ptilimnium nodosum*)

Listing/Date: Endangered/September 28, 1988

Group: Plants

Species Status: Stable

Recovery Priority: 8

Recovery Plan Title: Harperella Draft Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 5

Recovery Plan Stage/Date: U/August, 1990

Recovery Objective/Criteria: Delist / No criteria developed yet.

10. Major Activity Since Last Report: Population surveys, and monitoring of threats and habitat. Also, habitat and transplanting survival studies. Preparation of a technical/agency draft recovery plan was initiated.
11. Major Activity Over Next Reporting Period: Habitat protection through conservation easements in West Virginia with The Nature Conservancy. Completion of the recovery plan. Preparation of management plans. Genetic studies.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Dwarf-flowered heartleaf 451

Species: Dwarf-flowered heartleaf (*Hexastylis naniflora*)

Listing/Date: Threatened/April 14, 1989

Group: Plants

Species Status: Unknown

Recovery Priority: 8

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: U

Recovery Objective/Criteria: To delist the species; criteria for recovery have not been established yet.

10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

452 Mountain golden heather

1. Species: Mountain golden heather (*Hudsonia montana*)
2. Listing/Date: Threatened/October 20, 1980
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Mountain Golden Heather Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 14, 1983
9. Recovery Objective/Criteria: Delisting can be considered when: the five known populations are maintained at least at current levels and are self-sustaining; when species biology and site dynamics are sufficiently understood to assure effective long-term management and protection; protection and management policies of the U.S. Forest Service (owner of all known sites) are proven effective; and the species and its habitat are permanently protected.
10. Major Activity Since Last Report: Searches of potential habitat have been conducted, resulting in the discovery of one new population; existing populations have been monitored, documenting declines; experimental management involving prescribed burning and cutting of competing vegetation has been conducted (the plant responds very favorably to prescribed fire); plans are underway to burn the habitat of all existing populations and to continue monitoring.
11. Major Activity Over Next Reporting Period: Continuation of activities described in #10.
12. Recovery Achieved: 2
13. Information Current as of: June 1990

453 Hiquero de Sierra

1. Species: Hiquero de Sierra (*Crescentia portoricensis*)
2. Listing/Date: Endangered/December 4, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: *Crescentia portoricensis* Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/1990
9. Recovery Objective/Criteria: Downlist/Stabilize to a self-sustaining status when at least four new populations capable of self-perpetuation have been established within suitable protected areas.
10. Major Activity Since Last Report: None.
11. Major Activity Over Next Reporting Period: None specified.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Cook's holly 454

Species: Cook's holly (*Ilex cookii*)

Listing/Date: Endangered/June 16, 1990

Group: Plants

Species Status: Declining

Recovery Priority: 5

Recovery Plan Title: *Ilex cookii* and *Cyathea dryopteroides* Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: A/1990

Recovery Objective/Criteria: Downlist/Stabilize the species to a self-sustaining status when at least two new populations of each species capable of self-perpetuation have been established within protected units of the Commonwealth Forest System or on Federal land within the Caribbean National Forest.

10. Major Activity Since Last Report: None

11. Major Activity Over Next Reporting Period: None anticipated.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

Highlands scrub hypericum 455

Species: Highlands scrub hypericum (*Hypericum cumulicola*)

Listing/Date: Endangered/January 21, 1987

Group: Plants

Species Status: Declining

Recovery Priority: 2

Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: F/January 29, 1990

9. Recovery Objective/Criteria: Reclassification to threatened status can be considered when protection of 3 additional sites is accomplished. Recovery could be considered upon protection of at least 10 additional viable populations at 2 or more sites in Highland or Polk Counties.

10. Major Activity Since Last Report: Acquisition of a site at Lake Apthorpe by The Nature Conservancy. Fish and Wildlife Service and the State of Florida are planning habitat acquisition.

11. Major Activity Over Next Reporting Period: Potentially, land acquisition.

12. Recovery Achieved: 2

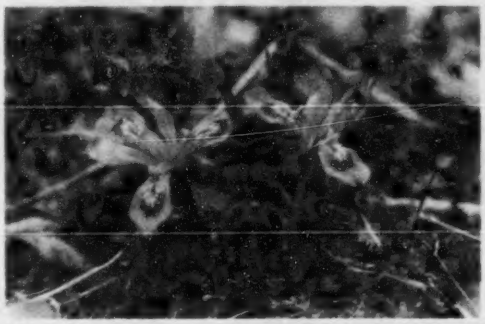
13. Information Current as of: July 1990

456 San Clemente Island Indian paintbrush

1. Species: San Clemente Island indian paintbrush (*Castilleja grisea*)
2. Listing/Date: Endangered/August 11, 1977
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: California Channel Islands Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Eliminate threats from introduced goats and pigs.
10. Major Activity Since Last Report: Intensive efforts to eradicate feral goats and pigs continue.
11. Major Activity Over Next Reporting Period: Continue to remove feral animals.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

457 Dwarf lake iris

1. Species: Dwarf lake iris (*Iris lacustris*)
2. Listing/Date: Threatened/September 28, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Delist. Criteria pending.
10. Major Activity Since Last Report: A recovery team has been formed, and several meetings have been held. A draft plan will be out in the early winter of 1990-91. Michigan is initiating a landowner contact program.
11. Major Activity Over Next Reporting Period: Continue searches for new sites, continue the Michigan landowner contact program, and complete the recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990



Dwarf lake irises are native to the shores of Lake Huron and Lake Michigan. Development and road construction threaten the species.

Ash Meadows ivesia 458

Species: Ash Meadows ivesia (*Ivesia eremica*)

Listing/Date: Threatened/May 20, 1985

Group: Plants

Species Status: Stable

Recovery Priority: 8

Recovery Plan Title: Ash Meadows Species Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: F/September 28, 1990

Recovery Objective/Criteria: Downlisting—when all following conditions have been met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish.

Delisting—the following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and four candidate plant species at all sites that they have historically occupied.

10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register. Monitoring of extant plant populations within Ash Meadows National Wildlife Refuge.

11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.

12. Recovery Achieved: 2

13. Information Current as of: September 1990

California jewelflower 459

Species: California jewelflower (*Caulanthus californicus*)

Listing/Date: Endangered/July 19, 1990

Group: Plants

Species Status: Declining

Recovery Priority: 2

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 1

Recovery Plan Stage/Date: Pending

Recovery Objective/Criteria: To be developed

10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.

11. Major Activity Over Next Reporting Period: The Bureau of Land Management will likely survey their lands for this species because of potential oil and gas leasing conflicts.

12. Recovery Achieved: 1

13. Information Current as of: September 1990

460 Kauai hau kuahiwi

1. Species: Kauai hau kuahiwi (*Hibiscadelphus distans*)
2. Listing/Date: Endangered/April 29, 1986
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: The State of Hawaii plans to construct three enclosures to protect the trees from herbivores. Two were sited to protect the maximum number of trees and the third was sited for use in introducing nursery stock. Nursery stock will be planted within and outside of the fence to compare effectiveness of enclosure.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

461 Ko'olau'ula

1. Species: Ko'olau'ula (*Abutilon menziesii*)
2. Listing/Date: Endangered/September 26, 1986
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: The State of Hawaii plans to construct an enclosure to protect wild plants from herbivores.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Koki‘o

462

1. Species: Koki‘o (= hau-hele‘ula) (*Kokia drynarioides*)
2. Listing/Date: Endangered/December 4, 1984
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Cooke's koki‘o

463

1. Species: Cooke's koki‘o (*Kokia cookei*)
2. Listing/Date: Endangered/October 30, 1979
3. Group: Plants
4. Species Status: Stable (captive propagation)
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: The only known plant has been grafted onto *Kokio kauaiensis* in botanical gardens. Grafts of the kokio were reintroduced into suitable areas on Hawaii during FY 90.
11. Major Activity Over Next Reporting Period: The reintroduction project will continue.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

464 Navasota ladies'-tresses

1. Species: Navasota ladies'-tresses (*Spiranthes parksii*)
2. Listing/Date: Endangered/May 6, 1982
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Navasota Ladies'-tresses Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 21, 1984
9. Recovery Objective/Criteria: Stabilize.
10. Major Activity Since Last Report: The 1989-90 monitoring transplant report was received from Bolton Williams at Texas Municipal Power Agency. The drought in eastern Texas may have caused a population fluctuation in this species.
11. Major Activity Over Next Reporting Period: Unknown.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

465 Hyan lagu

1. Species: Hyan lagu (Serianthes) (*Serianthes nelsonii*)
2. Listing/Date: Endangered/February 18, 1987
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

San Clemente Island larkspur

466

1. Species: San Clemente Island larkspur (*Delphinium kinkiense*)
2. Listing/Date: Endangered/August 11, 1977
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: California Channel Islands Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/January 1984
9. Recovery Objective/Criteria: Eliminate threat from introduced goats and pigs.
10. Major Activity Since Last Report: Intensive efforts to eradicate feral goats and pigs continue.
11. Major Activity Over Next Reporting Period: Continue removal of feral animals.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Crenulate lead-plant

467

1. Species: Crenulate lead-plant (*Amorpha crenulata*)
2. Listing/Date: Endangered/July 18, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 5C
6. Recovery Plan Title: Recovery Plan for 5 Pine Rockland Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 7, 1988
9. Recovery Objective/Criteria: Downlisting to threatened status could be considered if 10 populations were established and considered viable.
10. Major Activity Since Last Report: Fairchild Tropical Garden is carrying out garden propagation for the Center for Plant Conservation. The Metropolitan Dade County government is attempting to effectively manage the only viable population, which is in semi-natural pineland vegetation badly infested with Scheffiera and other exotic plants.
11. Major Activity Over Next Reporting Period: Possible conservation of some possibly suitable habitat (see *Euphorbia deltoidea*).
12. Recovery Achieved: 1
13. Information Current as of: July 1990

468
Alabama leather flower

1. Species: Alabama leather flower (*Clematis socialis*)
2. Listing/Date: Endangered/September 26, 1986
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Alabama Leather Flower Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/December 27, 1989
9. Recovery Objective/Criteria: Downlist Protection and management of 10 viable and geographically distinct populations, each occupying a minimum of 1 acre.
10. Major Activity Since Last Report: Initiation of a research project on management technique experiments. Obtained a long-term protection agreement for the population in Cherokee County, AL.
11. Major Activity Over Next Reporting Period: Management technique experiments will continue and a progress report will be submitted. Surveys will be conducted for additional populations.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

469
Minnesota trout lily

1. Species: Minnesota trout lily (*Erythronium propullans*)
2. Listing/Date: Endangered/March 26, 1986
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Minnesota Trout Lily Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: F/December 16, 1987
9. Recovery Objective/Criteria: Downlisting to threatened can be considered when 400 naturally occurring colonies in ten geographically distinct sites are protected and managed to insure their continued existence. Delisting can be initiated when 500 colonies in 15 sites are protected and managed over the entire range of the species.
10. Major Activity Since Last Report: Monitoring program at Nerstrand Woods State Park continues. Searches for new sites continue. A public information brochure was completed and printed in a cooperative venture between the Minnesota Department of Natural Resources and the Service. The Nature Conservancy continues to negotiate with several landowners concerning the acquisition of their property.
11. Major Activity Over Next Reporting Period: Continue searches and activities to protect known sites.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

Nehe 470

1. Species: Nehe (*Lipochaeta venosa*)
2. Listing/Date: Endangered/October 30, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: The State of Hawaii plans to construct a fire break to protect some of the colonies from wildfires.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Santa Barbara Island liveforever 471

1. Species: Santa Barbara Island liveforever (*Dudleya traskiae*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8C
6. Recovery Plan Title: Santa Barbara Island Liveforever Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/June 27, 1985
9. Recovery Objective/Criteria: Expand the distribution of the plant to 95% of the suitable habitat on the island.
10. Major Activity Since Last Report: A report was recently issued reviewing the results of a 5 year monitoring program funded by U.S. Fish and Wildlife Service and California Department of Fish and Game. The population appears to be stable in total numbers, with some mortality and some recruitment occurring. Recruitment appears to be a cyclic, rather than an annual event, and may be tied to years with abundant rainfall. The number of floretes per plant also may vary with annual rainfall.
11. Major Activity Over Next Reporting Period: Continue annual monitoring.
12. Recovery Achieved: 1
13. Information Current as of: February 1990

The Santa Barbara Island liveforever is restricted to Santa Barbara Island off the coast of southern California. Introduced species, such as goats, rabbits, and other plants, have wreaked havoc on the liveforever. Although the goats and rabbits have been removed, the Fish and Wildlife Service has recommended the removal of all remaining exotic species.

472 Fassett's locoweed

1. Species: Fassett's locoweed (*Oxytropis campestris* var. *chartacea*)
2. Listing/Date: Threatened/ September 28, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Recovery Plan for Fassett's Locoweed (*Oxytropis campestris* var. *chartacea*)
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: A/August 1, 1990
9. Recovery Objective/Criteria: Delist. Protect and manage all five naturally occurring populations.
10. Major Activity Since Last Report: A contractor was selected to prepare a recovery plan by December 31, 1990. The Wisconsin Department of Natural Resources has acquired a site with a large population of Fassett's locoweed.
11. Major Activity Over Next Reporting Period: Continue efforts to protect habitat, continue searches for new populations, and initiate monitoring of known populations. Complete and distribute recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

473 Bradshaw's lomatium

1. Species: Bradshaw's lomatium (*Lomatium bradshawii*)
2. Listing/Date: Endangered/September 30, 1988
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Criteria being developed.
10. Major Activity Since Last Report: Preliminary recovery planning .
11. Major Activity Over Next Reporting Period: Recovery planning meetings.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Rough-leaved loosestrife 474

Species: Rough-leaved loosestrife (*Lysimachia asperulaefolia*)

Listing/Date: Endangered/June 12, 1987

Group: Plants

Species Status: Unknown

Recovery Priority: 8

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: U

Recovery Objective/Criteria: To be developed.

10. Major Activity Since Last Report: Major landowners have been contacted regarding protection of the species on their land; management to benefit the species (prescribed burning) has been conducted on several sites owned by The Nature Conservancy and the U.S. Forest Service.
11. Major Activity Over Next Reporting Period: Continuation of tasks in #10, as well as monitoring and expanded management.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Furbish lousewort 475

Species: Furbish lousewort (*Pedicularis furbishiae*)

Listing/Date: Endangered/April 26, 1978

Group: Plants

Species Status: Stable

Recovery Priority: 14

Recovery Plan Title: Furbish Lousewort Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 5

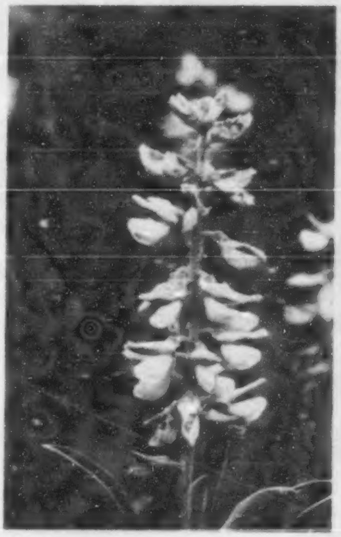
Recovery Plan Stage/Date: F/June 29, 1983

Recovery Objective/Criteria: Downlist / Protect and maintain the 28 known lousewort colonies, and establish 10 new reproducing populations on St. Johns River in Maine.

10. Major Activity Since Last Report: Revision of recovery plan initiated; the plan will include a revised recovery objective. Other activities include population and habitat surveys, habitat protection, habitat manipulation to eliminate woody vegetation where necessary, and public education. The Furbish lousewort population is stable and possibly slightly increasing.
11. Major Activity Over Next Reporting Period: The activities mentioned above will continue. The focus will be on habitat protection and management. Reclassification of the species will be considered.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

476 Scrub lupine

1. Species: Scrub lupine (*Lupinus aridorum*)
2. Listing/Date: Endangered/April 7, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: The only "recovery" objective at the present time is to prevent extinction.
10. Major Activity Since Last Report: Interested individuals inventoried sites with this species during its flowering season in 1989 and 1990.
11. Major Activity Over Next Reporting Period: Acquisition of at least one site by private or government bodies is badly needed.
12. Recovery Achieved: 2
13. Information Current as of: July 1990



A rare Florida plant, the scrub lupine, is in serious danger due to clearing of its habitat for agriculture and residential development.

477 Kern mallow

1. Species: Kern mallow (*Eremalche kernensis*)
2. Listing/Date: Endangered/July 19, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: The Bureau of Land Management likely will survey their lands for this species because of potential oil and gas leasing and conflicts.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

Peter's Mountain mallow 478

1. Species: Peter's Mountain mallow (*Iliamna corei*)
2. Listing/Date: Endangered/May 12, 1986
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 5
6. Recovery Plan Title: Peter's Mountain Mallow (*Iliamna corei*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlist / A natural population of a least 50 clones that is self-maintaining for at least 5 years, and permanently protected habitat. Delisting can occur when two additional populations have been established within the plant's historical range.
10. Major Activity Since Last Report: Acquisition of the property where the natural population occurs is under negotiation by The Nature Conservancy. Other activities include population monitoring, germination of the plant in plant breeding facilities, and life history studies.
11. Major Activity Over Next Reporting Period: Habitat acquisition, continued studies and plant propagation, establishment of new populations.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Palma de manaca 479

1. Species: Palma de manaca (*Calyptronoma rivalis*)
2. Listing/Date: Threatened/February 6, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Propagation and reintroduction into protected conservation areas.
11. Major Activity Over Next Reporting Period: Continue the propagation program and reintroduction into protected conservation areas.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

480

Presidio or Raven's manzanita

1. Species: Presidio or Raven's manzanita (*Arctostaphylos pungens ssp. ravenii*)
2. Listing/Date: Endangered/October 26, 1979
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 12
6. Recovery Plan Title: Raven's Manzanita Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/July 10, 1984
9. Recovery Objective/Criteria: Downlist when the known population (which consists of one extant plant) is increased to 20+ plants and there are 4 additional populations of 20+ plants.
10. Major Activity Since Last Report: Transplanted cuttings of the manzanita to areas adjacent to known population on Presidio. At least fifty plants were established in the wild by January 1988.
11. Major Activity Over Next Reporting Period: Monitoring of plant reintroduction success will continue.
12. Recovery Achieved: 2
13. Information Current as of: July 17, 1990

481

Cooley's meadowrue

1. Species: Cooley's meadowrue (*Thalictrum cooleyi*)
2. Listing/Date: Endangered/February 7, 1989
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Major landowners have been contacted regarding protection of the plant on their lands; conservation agreements have been established with some landowners and utility companies which have rights-of-way affecting populations; searches for additional populations in potential habitat have been conducted; property supporting one North Carolina population has been acquired and is being managed for the benefit of the species.
11. Major Activity Over Next Reporting Period: Continuation of activities described in #10, as well as population monitoring.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

San Diego mesa-mint 482

1. Species: San Diego mesa-mint (*Pogogyne abramsii*)
2. Listing/Date: Endangered/September 28, 1978
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: San Diego Mesa Mint Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/1988
9. Recovery Objective/Criteria: Protect remaining vernal pools and their watersheds that are occupied or could be occupied by this species.
10. Major Activity Since Last Report: Efforts are being made to secure many of the remaining pools as a national wildlife refuge.
11. Major Activity Over Next Reporting Period: Continue efforts to protect remaining vernal pools. Distribute recovery plans.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Ash Meadows milk-vetch 483

1. Species: Ash Meadows milk-vetch (*Astragalus phoenix*)
2. Listing/Date: Threatened/May 20, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—when all of following conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish.

   Delisting—the following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and four candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register. Monitoring of extant plant populations within Ash Meadows National Wildlife Refuge.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September 1990

484 Heliotrope milk-vetch

1. Species: Heliotrope milk-vetch (*Astragalus montii*)
2. Listing/Date: Threatened/November 6, 1987
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 17
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: The Forest Service and the Fish and Wildlife Service are conducting population monitoring studies. This species is a small endemic population with limited distribution. Potential threats are habitat disturbance from energy development and grazing.
11. Major Activity Over Next Reporting Period: Population monitoring will continue to determine population changes and evidence of habitat disturbance from human activities. A recovery plan is needed but is a lower priority, and is unplanned for the next reporting period.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

485 Jesup's milk-vetch

1. Species: Jesup's milk-vetch (*Astragalus robbinsii* var. *jesupi*)
2. Listing/Date: Endangered/June 5, 1987
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 12
6. Recovery Plan Title: Jesup's Milk-Vetch (*Astragalus robbinsii* var. *jesupi*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/November 21, 1980
9. Recovery Objective/Criteria: Stabilize. Protect and maintain the three known populations and their essential habitat along the Connecticut River. Downlisting will be considered based upon the location of establishment of 7 additional populations, each with at least 100 individual plants.
10. Major Activity Since Last Report: Population monitoring, interagency coordination to protect the plant's habitat, and life history studies. Attempts to propagate the plant, which were unsuccessful. Completion of recovery plan.
11. Major Activity Over Next Reporting Period: Life history studies and propagation efforts will continue. Demographic studies will be conducted. Habitat protection will be strengthened.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Mancos milk-vetch

486

1. Species: Mancos milk-vetch (*Astragalus humillimus*)
2. Listing/Date: Endangered/June 27, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Mancos Milk-vetch Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/December 20, 1989
9. Recovery Objective/Criteria: Downlist. Develop Habitat Management Plans to insure protection of 75% of known habitat. Establish permanent study plots.
10. Major Activity Since Last Report: Monitoring continues on Bureau of Land Management and Navajo Indian lands. Population decreases have occurred within the plots, which may be the result of severe drought in 1989. One new population was discovered by the Navajo Natural Heritage Program. The pollination biology of this species is being studied by the U.S. Department of Agriculture.
11. Major Activity Over Next Reporting Period: Continued monitoring.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

Osterhout milk-vetch

487

1. Species: Osterhout milk-vetch (*Astragalus osterhoutii*)
2. Listing/Date: Endangered/July 13, 1989
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Penland Beardtongue/Osterhout Milk-vetch Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: T/A
9. Recovery Objective/Criteria: Conservation of existing population.
10. Major Activity Since Last Report: Seeds were collected and viability tests were conducted in 1989. Germination tests are being conducted on seeds collected in 1990.
11. Major Activity Over Next Reporting Period: Occupied habitat will be purchased by the Colorado Water Conservation District for transfer to Bureau of Land Management. Design of the recreation facilities at the proposed Muddy Creek Reservoir will incorporate plant protection. Habitat studies will be conducted. The recovery plan to be drafted in 1990/91 will be a joint recovery plan with Penland beardtongue.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

488 Small's milkpea

1. Species: Small's milkpea (*Galactia smallii*)
2. Listing/Date: Endangered/July 18, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Recovery Plan for Five Pine Rockland Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 7, 1988
9. Recovery Objective/Criteria: Reclassification to threatened status can be considered if 10 self-sustaining populations of this species were secured. Delisting could be considered if 20 such populations were secured.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated, unless this plant is confirmed to occur at the Richmond Field sites, along with the endangered *Euphorbia deltoidea*.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

489 Mead's milkweed

1. Species: Mead's milkweed (*Asclepias meadii*)
2. Listing/Date: Threatened/September 1, 1988.
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Pending
10. Major Activity Since Last Report: Recovery team has been formed, has met twice, and intends to have a technical draft out soon. New population found in Iowa. Surveys in Missouri resulted in the discovery of 15 new populations, bringing the total in Missouri to 46. There is potential for additional sites in Missouri.
11. Major Activity Over Next Reporting Period: Continue and complete recovery plan preparation. Continue to search for new sites. Research to better understand the genetic distinctness among and between populations will be initiated, and will be jointly funded by the Fish and Wildlife Service and the Forest Service. The Missouri Department of Conservation will initiate a monitoring study on one of their State-owned prairies.
12. Recovery Achieved: 1
13. Information Current as of: July 7, 1990

Welsh's milkweed 490

1. Species: Welsh's milkweed (*Asclepias welshii*)
2. Listing/Date: Threatened/October 28, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Welsh's Milkweed Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Under development
10. Major Activity Since Last Report: The State of Utah has developed a management plan for this species, including the designation of off-road vehicle (ORV) use zones; however, the plan is basically unenforceable due to difficulty of controlling ORV use. A third small population has been discovered on the Utah/Arizona border.
11. Major Activity Over Next Reporting Period: A recovery plan will be developed and monitoring of the population status will be undertaken to identify future population changes and new or continuing threats or disturbances. Due to the species' habitat being located in a designated ORV use area (the Coral Pink Sand Dunes), the plant is currently considered unrecoverable; however, the population is protectable if active protection efforts are carried out. The Service will consider use of Section 6 funds to assist the State in conducting active species protection.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Garrett's mint 491

1. Species: Garrett's mint (Dicerandra christmanii)
2. Listing/Date: Endangered/September 21, 1989
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for 3 Florida Mints.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 1, 1987
9. Recovery Objective/Criteria: Reclassification to threatened status is possible when 10 separate, self-sustaining populations of the species are established at secure, maintained sites.
10. Major Activity Since Last Report: The State has purchased habitat similar to that occupied by this species, which may allow for eventual establishment of new populations. The Fish and Wildlife Service initiated planning for land purchase in the area, as did The Nature Conservancy. Eric Menges is studying the demography of a closely-related species.
11. Major Activity Over Next Reporting Period: Postential acquisition of habitat by the Fish and Wildlife Service, State, The Nature Conservancy, or other private parties.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

492 Lakela's mint

1. Species: Lakela's mint (*Dicerandra immaculata*)
2. Listing/Date: Endangered/May 15, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Recovery Plan for 3 Florida Mints.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 1, 1987
9. Recovery Objective/Criteria: Reclassification to threatened status is possible when 10 separate, self-sustaining populations of the species are established at secure, maintained sites.
10. Major Activity Since Last Report: A garden population has been established at Bok Tower Gardens (Center for Plant Conservation).
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

493 Longspurred mint

1. Species: Longspurred mint (*Dicerandra cornutissima*)
2. Listing/Date: Endangered/November 1, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Recovery Plan for 3 Florida Mints.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 1, 1987
9. Recovery Objective/Criteria: Reclassification to threatened status is possible when 10 separate, self-sustaining populations of the species are established at secure, maintained sites.
10. Major Activity Since Last Report: The Nature Conservancy investigated establishing a preserve for this species and the Florida scrub jay. A new, small population was discovered 13 miles west of previously known sites.
11. Major Activity Over Next Reporting Period: None definitely expected. The plant occurs on some empty lots owned by the Federal Deposit Insurance Corporation; a determination will have to be made on whether the sites can be sold without arranging for protection of the plants.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Scrub mint 494

1. Species: Scrub mint (*Dicerandra frutescens*)
2. Listing/Date: Endangered/November 1, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for 3 Florida Mints.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/July 1, 1987
9. Recovery Objective/Criteria: Reclassification to threatened status is possible when 10 separate, self-sustaining populations of the species are established at secure, maintained sites.
10. Major Activity Since Last Report: The State has purchased habitat similar to that occupied by this species, which may allow for eventual establishment of new species. Fish and Wildlife Service initiated planning for land purchase in the area, as did The Nature Conservancy. Eric Menges at Archbold Biological Station is researching population biology.
11. Major Activity Over Next Reporting Period: Potential acquisition of habitat by Fish and Wildlife Service, State, Nature Conservancy or other private parties.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Michigan monkey-flower 495

1. Species: Michigan monkey-flower (*Mimulus glabratus* var. *michiganensis*)
2. Listing/Date: Endangered/June 21, 1990
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Delist
10. Major Activity Since Last Report: In the course of a resort development along the shore of Lake Michigan, another population was discovered, bringing the total known occurrences to 13.
11. Major Activity Over Next Reporting Period: Initiate actions to complete a recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

496

Northern wild monkshood

1. Species: Northern wild monkshood (*Aconitum noveboracense*)
2. Listing/Date: Threatened/December 30, 1974
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Northern Monkshood (*Aconitum noveboracense*)
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: R/F/September 23, 1983
9. Recovery Objective/Criteria: Delisting can be considered when one-half of the 109 known sites containing at least one-half of the known plants in each state are permanently protected and distributed in the three distinct geographical areas.
10. Major Activity Since Last Report: The Driftless Area acquisition program is under way in northeast Iowa. A number of sites have been acquired, and acquisition of additional areas being pursued. Monitoring activities have been ongoing for several years. Fencing has been done at several sites to eliminate the threats from neighboring livestock operations.
11. Major Activity Over Next Reporting Period: Continue acquisition, protection, and monitoring activities.
12. Recovery Achieved: 2
13. Information Current as of: July 27, 1990

497

Carter's mustard

1. Species: Carter's mustard (*Warea carteri*)
2. Listing/Date: Endangered/January 21, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: Tentatively, protection of at least five sites with viable populations of this plant would suffice for reclassification to threatened status. Delisting would require protection of at least 10 sites.
10. Major Activity Since Last Report: A new population was discovered in Brevard County. State purchase of Lake Arbuckle State Forest and development of a management plan with technical assistance from The Nature Conservancy may benefit this species.
11. Major Activity Over Next Reporting Period: Possible acquisition of more habitat by the State or the Fish and Wildlife Service.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Slender-petaled mustard

498

1. Species: Slender-petaled mustard (*Thelypodium stenopetalum*)
2. Listing/Date: Endangered/August 31, 1984
3. Group: Plants
4. Species Status: Declining, partially due to drought
5. Recovery Priority: 5C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/FY 91
9. Recovery Objective/Criteria: Protect remaining populations and expand into adjacent wet meadow habitats. This species persists within 25 acres of wet meadow habitat within Big Bear Valley. Expansion of this species into several hundred acres of wet meadow is possible.
10. Major Activity Since Last Report: Preserved 10 acres of wet meadow habitat containing this species through a Corps of Engineers permit application.
11. Major Activity Over Next Reporting Period: Preserve an additional 7 acres of habitat through a Corps of Engineers permit.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Dwarf naupaka

499

1. Species: Dwarf naupaka (*Scaevola coriacea*)
2. Listing/Date: Endangered/May 16, 1986
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

500 Cobana negra

1. Species: Cobana negra (*Stahlia monosperma*)
2. Listing/Date: Threatened/April 5, 1990
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 4
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Propagation efforts conducted by the University of Puerto Rico and reintroduction into protected areas.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 12, 1990

501 Amargosa niterwort

1. Species: Amargosa niterwort (*Nitrophila mohavensis*)
2. Listing/Date: Endangered/May 20, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—when all of following conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish.

   Delisting—the following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and four candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register. Monitoring of extant plant populations within Ash Meadows National Wildlife Refuge.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September 1990

Hinckley's oak 502

1. Species: Hinckley's oak (*Quercus hinckleyi*)
2. Listing/Date: Threatened/August 26, 1988
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Sul Ross State University in Alpine, Texas, is doing micropropagation (tissue culture) on this species. There is concern that this species may be genetically swamped with another species of oak (*Quercus pungens*). The Texas Natural Heritage Program is interested in having some isozyme and flavonoid work done to answer how much genetic swamping is occurring.
11. Major Activity Over Next Reporting Period: Unknown.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

Eastern prairie fringed orchid 503

1. Species: Eastern prairie fringed orchid (*Platanthera leucophaea*)
2. Listing/Date: Threatened/ September 28, 1989
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Delist. Criteria to be developed.
10. Major Activity Since Last Report: A contractor has been selected to prepare a recovery plan; the technical draft is due February 1, 1991, with the final plan anticipated approximately June 1, 1992.
11. Major Activity Over Next Reporting Period: Continue to monitor existing populations, search for new occurrences, complete recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

The eastern prairie fringed orchid has declined as the prairie habitat upon which it depends has disappeared. Historically known from 15 states and in Canada, it has been reduced to sites in 7 states.

504

Western prairie fringed orchid

1. Species: Western prairie fringed orchid (*Platanthera praeclara*)
2. Listing/Date: Threatened/ September 28, 1989
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 3
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Delist. Criteria being developed.
10. Major Activity Since Last Report: A recovery team has been formed, and has been asked to complete a recovery plan by January 1, 1992.
11. Major Activity Over Next Reporting Period: Complete recovery plan, continue searches for new populations, and establish monitoring programs for existing populations.
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

505

Palo de Nigua

1. Species: Palo de Nigua (*Cornutia obovata*)
2. Listing/Date: Endangered/April 7, 1988
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: *Cornutia obovata* and *Daphnopsis hellerana* Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/April 1990
9. Recovery Objective/Criteria: Delisting/ To establish three additional populations of each species in protected areas such as the Commonwealth Forest Reserves. Privately-owned population sites should be protected.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Palo de Ramon 506

1. Species: Palo de Ramon (*Banara vanderbiltii*)
2. Listing/Date: Endangered/January 14, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: *Banara vanderbiltii* Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/1990
9. Recovery Objective/Criteria: Downlist. Reverse the decline and stabilize to self-sustaining condition by protection of existing populations and their habitats and establishing new populations at other appropriate sites in Puerto Rico.
10. Major Activity Since Last Report: Propagation efforts.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 12, 1990

Carter's panicgrass 507

1. Species: Carter's panicgrass (*Panicum carteri*)
2. Listing/Date: Endangered/October 12, 1983
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 11
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: The State of Hawaii expects to begin planting the grass at different locations on its islet to improve distribution.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

508

Beautiful pawpaw

1. Species: Beautiful pawpaw (*Deeringothamnus pulchellus*)
2. Listing/Date: Endangered/September 26, 1986
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for Three Florida Pawpaws.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 5, 1988
9. Recovery Objective/Criteria: This species can be considered for reclassification to threatened status when 10 self-sustaining populations are secured.
10. Major Activity Since Last Report: The state has declined to purchase habitat for this plant near Charlotte Harbor. This negative decision may be reversed.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

509

Four-petal pawpaw

1. Species: Four-petal pawpaw (*Asimina tetramera*)
2. Listing/Date: Endangered/September 26, 1986
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 11
6. Recovery Plan Title: Recovery Plan for Three Florida Pawpaws.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 5, 1988
9. Recovery Objective/Criteria: Can be downlisted to threatened if six more populations are protected or established.
10. Major Activity Since Last Report: State has purchased some suitable or occupied habitat for Savannah's State Reserve. State is considering (but has low priority) purchase of suitable, apparently unoccupied habitat south of Stuart. Hobe Sound National Wildlife Refuge has purchased a small tract of suitable habitat. State is implementing a much-needed prescribed fire plan for habitat at Jonathan Dickinson State Park. Florida Power and Light Company saved several plants and a tiny tract of habitat at its headquarters office. Bok Tower Gardens has established a garden population.
11. Major Activity Over Next Reporting Period: Hope to establish at least one new population.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Rugel's pawpaw

510

Species: Rugel's pawpaw (*Deeringothamnus rugelii*)

Listing/Date: Endangered/September 26, 1986

Group: Plants

Species Status: Declining

Recovery Priority: 2

Recovery Plan Title: Recovery Plan for Three Florida Pawpaws.

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: F/April 5, 1988

9. Recovery Objective/Criteria: This species can be considered for reclassification to threatened status when 10 self-sustaining populations are secured.
10. Major Activity Since Last Report: The Volusia County government has expressed interest in purchasing habitat for this species.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Pelos del diablo

511

Species: Pelos del diablo (*Aristida portoricensis*)

Listing/Date: Endangered/August 8, 1990

Group: Plants

Species Status: Declining

Recovery Priority: 5C

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 4

Recovery Plan Stage/Date: Pending

9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Initiate a draft recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

512 McKittrick pennyroyal

1. Species: McKittrick pennyroyal (*Hedeoma apiculatum*)
2. Listing/Date: Threatened/July 13, 1982
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: McKittrick Pennyroyal Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/April 12, 1985
9. Recovery Objective/Criteria: Delist—The New Mexico Heritage Program has done a lot of work on this species and found additional plants on inaccessible limestone cliffs. There are few threats to this species and many more plants than were previously thought.
10. Major Activity Since Last Report: Paul Knight mapped additional populations in the Guadalupe Mountains of New Mexico during 1989-90.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 2
13. Information Current as of: July 26, 1990

513 Todsen's pennyroyal

1. Species: Todsen's pennyroyal (*Hedeoma todsenii*)
2. Listing/Date: Endangered/January 19, 1981
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Todsen's Pennyroyal Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 22, 1985
9. Recovery Objective/Criteria: Downlist. Protect habitat from degradation and manage for healthy populations.
10. Major Activity Since Last Report: Surveys are being conducted by the State and Bureau of Land Management to discover additional populations on the west slope of the Sacramento Mountains. Two new populations have been discovered and more extensive survey will be done in August.
11. Major Activity Over Next Reporting Period: Surveys for new populations
12. Recovery Achieved: 1
13. Information Current as of: July 27, 1990

Blowout penstemon 514

1. Species: Blowout penstemon (*Penstemon haydenii*)
2. Listing/Date: Endangered/September 1, 1987
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 11C
6. Recovery Plan Title: Blowout Penstemon Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Under development
10. Major Activity Since Last Report: Nebraska Game and Parks Commission is currently mapping locations and determining population status; determining ecological requirements for germination, growth and establishment; developing propagation techniques; and characterizing the environmental requirements and life history of this species.
11. Major Activity Over Next Reporting Period: Studies funded by Nebraska Game and Parks Commission investigating the status, ecology, and propagation of this species will continue. The draft recovery plan will be completed in FY 90.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Wheeler's peperomia 515

1. Species: Wheeler's peperomia (*Peperomia wheeleri*)
2. Listing/Date: Endangered/January 14, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: *Peperomia wheeleri* Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/1990
9. Recovery Objective/Criteria: Downlist/Stabilize to self-sustaining condition, protecting the existing populations and their habitats and establish new populations at other appropriate sites in Culebra and Puerto Rico.
10. Major Activity Since Last Report: Propagation efforts.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

516 Clay phacelia

1. Species: Clay phacelia (*Phacelia argillacea*)
2. Listing/Date: Endangered/September 28, 1978
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Clay Phacelia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/April 12, 1982
9. Recovery Objective/Criteria: Downlist. Establish a self-sustaining population of 2,000-3,000 individuals on 120 acres of protected habitat and possibly establish at least 1 new population.
10. Major Activity Since Last Report: The Nature Conservancy has purchased habitat. The Fish and Wildlife Service has constructed cages to protect remaining plants from wildlife (deer and elk) and livestock (sheep) grazing. Studies are being conducted on the reproductive and pollination biology of the plant. Brigham Young University has begun research on the biology and ecology of the species as outlined in the recovery plan. The Forest Service has conducted inventories on their lands and has identified an additional small population on nearby private lands.
11. Major Activity Over Next Reporting Period: A horticultural population will be established at the University of Utah Arboretum. Delineated recovery criteria are considered insufficient and will be reevaluated as part o a recovery plan revision. Biolog and ecology studies will continu as will habitat inventories to ider tify additional populations. Information from these studies will be used in analyzing the pos sibility of establishing additional populations on public lands.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

517 North Park phacelia

1. Species: North Park phacelia (*Phacelia formosula*)
2. Listing/Date: Endangered/September 1, 1982
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 5
6. Recovery Plan Title: North Park Phacelia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/March 21, 1986
9. Recovery Objective/Criteria: Downlisting—Locate and secure 5 occurrences of approximately 500 mature flowering individuals each. Delisting—secure 10 additional areas with 500 mature flowering individuals each.
10. Major Activity Since Last Report: A joint management plan has been developed by Colorado Natural Areas Program, Bureau of Land Management, and the Service.
11. Major Activity Over Next Reporting Period: A study of the reproductive biology of the plant will be completed in FY 90. This study will provide information on pollination methods, seed viability and germination, and other aspects of plant reproduction that will be used to identify habitat protection requirements and potential propagation techniques.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

Swamp pink

518

1. Species: Swamp pink (*Helonias bullata*)
2. Listing/Date: Threatened/September 9, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 7C
6. Recovery Plan Title: Swamp Pink (*Helonias bullata*) Technical Draft Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: T/May, 1990
9. Recovery Objective/Criteria: Delist / 1. Permanent protection secured for sites that are viable, representative of range-wide distribution, or representative of habitat or genetic diversity (the number of sites will be determined for agency draft); 2. stabilization of range-wide species' status (currently 111 sites in 7 states).
10. Major Activity Since Last Report: Population surveys and studies, disturbance studies, and development of site protection strategies. Preparation of a recovery plan is under way.
11. Major Activity Over Next Reporting Period: Electrophoretic analysis to determine genetic diversity. Search for additional sites within historic range. Completion of recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Davis' green pitaya

519

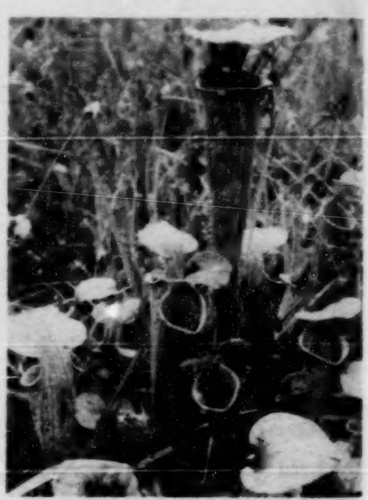
1. Species: Davis' green pitaya (*Echinocereus viridiflorus* var. *davisii*)
2. Listing/Date: Endangered/November 7, 1979
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Davis' Green Pitaya Cactus Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 20, 1984
9. Recovery Objective/Criteria: Stabilize.
10. Major Activity Since Last Report: Texas Natural Heritage Program is currently being denied access to this population on private property.
11. Major Activity Over Next Reporting Period: Unknown.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

520 Alabama canebrake pitcher-plant

1. Species: Alabama canebrake pitcher-plant (*Sarracenia rubra* ssp. *alabamensis*)
2. Listing/Date: Endangered/March 10, 1989
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 6
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be determined.
10. Major Activity Since Last Report: Principal landowners are being contacted to encourage their assistance in protecting populations on their property.
11. Major Activity Over Next Reporting Period: Emphasis will be on the development of a recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

521 Green pitcher-plant

1. Species: Green pitcher-plant (*Sarracenia oreophila*)
2. Listing/Date: Endangered/September 21, 1979
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 8
6. Recovery Plan Title: Green Pitcher Plant Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: Rev/F/April 5, 1985
9. Recovery Objective/Criteria: Delist. Attain long-term protection/management of 15 colonies, including at least 3 colonies in the 4 geographically distinct populations; attain approximate values of plants for each colony by habitat type as follows: [seepage bog—20% cover, flatwoods—5% frequency, 5% cover; streambank—10% frequency, 2% cover]; achieve consistent seed production followed by seedling establishment.
10. Major Activity Since Last Report: Ongoing recovery activities include prescribed burns to manage habitat and improve vigor of colonies, transplantation experiments, monitoring of all protected colonies and the reestablishment site, the location and protection of an additional colony in the Sand Mountain area, and a seed predation study. This species' status has improved (increased flowering and fruit production) as a result of management activities.
11. Major Activity Over Next Reporting Period: Projects listed above (#10) will continue during the next FY. Additional surveys will be conducted to search for new populations in the Coosa and Lake Chatuge areas. Several new populations will be entered into the monitoring program.
12. Recovery Achieved: 2



The green pitcher plant, an insectivorous species, is dependent on wetlands, many of which have disappeared due to drainage and filling. This species is now found only in a small section of Alabama and Georgia.

13. Information Current as of: June 1990

Mountain sweet pitcher-plant

522

1. Species: Mountain sweet pitcher-plant (*Sarracenia rubra* ssp. *jonesii*)
2. Listing/Date: Endangered/September 30, 1988
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Recovery Plan for Mountain Sweet Pitcher Plant
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: A/August 28, 1989
9. Recovery Objective/Criteria: Downlisting can be considered when at least 4 populations within each occupied drainage (12 populations total) are self-sustaining or permanently protected.
10. Major Activity Since Last Report: Landowners have been contacted regarding the protection of the species on their lands; three of the South Carolina populations have been acquired and are being protected; research is underway to determine necessary management; monitoring and studies of population demography are under way.
11. Major Activity Over Next Reporting Period: Continuation of activities under #10, as well as implementation of management.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Scrub plum

523

1. Species: Scrub plum (*Prunus geniculata*)
2. Listing/Date: Endangered/January 21, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: For reclassification to threatened status, this species requires protection of 8 viable populations on a minimum of 4 sites, with sites in each of Highlands, Polk, and Lake Counties. Recovery could be considered if 20 viable populations are protected at a minimum of 5 sites.
10. Major Activity Since Last Report: Populations are being protected at recently-purchased Lake Arbuckle State Forest, where a management plan is being developed with the assistance of The Nature Conservancy. Purchase of populations at Saddle Blanket Lakes and Catfish Creek (by the State) is underway.
11. Major Activity Over Next Reporting Period: Purchase(s) of population(s) by Fish and Wildlife Service is in the planning stages; The Nature Conservancy may acquire one or more sites.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

524 Small whorled pogonia

1. Species: Small whorled pogonia (*Isotria medeoloides*)
2. Listing/Date: Endangered/September 10, 1982
3. Group: Plants
4. Species Status: Improving
5. Recovery Priority: 14
6. Recovery Plan Title: Small Whorled Pogonia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: F/January 16, 1985
9. Recovery Objective/Criteria: Downlist—The establishment or location, and subsequent protection, of 30 populations (sites) consisting of at least 20 individuals each. Distribution of these sites should be throughout the historic range with at least 15 populations in New England.
10. Major Activity Since Last Report: Populations surveys and monitoring. Demographic studies. Habitat protection.
11. Major Activity Over Next Reporting Period: The plan will be updated or revised, and reclassification of the species will be investigated. Habitat protection and searches for additional populations will continue.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

525 Tiny polygala

1. Species: Tiny polygala (*Polygala smallii*)
2. Listing/Date: Endangered/July 18, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 5C
6. Recovery Plan Title: Recovery Plan for Five Pine Rockland Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 7, 1988
9. Recovery Objective/Criteria: Reclassification to threatened status can be considered if 10 self-sustaining populations are secured.
10. Major Activity Since Last Report: Florida Power & Light Company and the Metropolitan Dade County Department of Environmental Resources Management have cooperated to develop a management plan for a power line right-of-way inhabited by this plant.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Pondberry 526

1. Species: Pondberry (*Lindera melissifolia*)
2. Listing/Date: Endangered/July 31, 1986
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To delist the species; recovery criteria have not been established yet
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Technical draft recovery plan will be distributed in FY 90.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

Sacramento prickly-poppy 527

1. Species: Sacramento prickly-poppy (*Argemone pleiacantha* ssp. *pinnatisecta*)
2. Listing/Date: Endangered/August 24, 1989
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 3
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Downlisting. Determine means of maintaining stable population numbers.
10. Major Activity Since Last Report: The Forest Service is continuing to study aspects of prickly poppy biology in a small nursery population. The Forest Service is developing a management plan and has done surveys to locate additional plants.
11. Major Activity Over Next Reporting Period: Continue surveys for new populations. Review and finalize recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 29, 1990

528 Texas poppy mallow

1. Species: Texas poppy mallow (*Callirhoe scabriuscula*)
2. Listing/Date: Endangered/January 13, 1981; August 6, 1981
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Texas Poppy Mallow Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/March 29, 1985
9. Recovery Objective/Criteria: Stabilize.
10. Major Activity Since Last Report: Dr. Bonnie Amos at San Angelo State University has turned in a final report on the seed germination investigation of this species. It contains useful information on various seed treatments that can be successfully used to propagate this rare species.
11. Major Activity Over Next Reporting Period: Unknown at present.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

529 Price's potato-bean

1. Species: Price's potato-bean (*Apios priceana*)
2. Listing/Date: Threatened/January 5, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Not determined since recovery plan is not completed.
10. Major Activity Since Last Report: No action taken.
11. Major Activity Over Next Reporting Period: Emphasis will be placed on the development of the recovery plan. Key landowners will be contacted and encouraged to protect populations on their property. If funding becomes available, surveys will be conducted to search for additional sites.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Fragrant prickly-apple

530

1. Species: Fragrant prickly-apple (*Cereus eriophorus* var. *fragrans*)
2. Listing/Date: Endangered/November 1, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 3
6. Recovery Plan Title: Recovery Plan for Fragrant Prickly-Apple Cactus.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/August 29, 1988
9. Recovery Objective/Criteria: Reclassification to threatened status can be considered when 10 geographically distinct populations are protected within its historic range.
10. Major Activity Since Last Report: Garden propagation underway at Bok Tower Gardens. Research on the species' population biology by Dr. John Rae (Francis Marion College, Florence, SC). Contact with one private landowner.
11. Major Activity Over Next Reporting Period: Attempt to purchase habitat for Savannah's State Reserve.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

St. Thomas prickly-ash

531

1. Species: St. Thomas prickly-ash (*Zanthoxylum thomasianum*)
2. Listing/Date: Endangered/December 20, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: St. Thomas Prickly-ash (*Zanthoxylum thomasianum*) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/April 5, 1988
9. Recovery Objective/Criteria: Downlist. Reverse the decline and stabilize to self-sustaining condition by protecting existing populations and then establishing new populations at other appropriate sites in Puerto Rico and the U.S. Virgin Islands.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 12, 1990

532 Maguire primrose

1. Species: Maguire primrose (*Primula maguirei*)
2. Listing/Date: Threatened/August 21, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Maguire Primrose Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: F/September 1990
9. Recovery Objective/Criteria: Stabilize by ensuring that all populations are identified and included in management plans and that the populations are well monitored to ensure no adverse effects are occurring; ensuring that the Section 7 process is properly implemented to protect the species habitat from degradation; and ensuring that the Section 9 process and Convention on International Trade in Endangered Species of Wild Fauna and Flora is properly utilized to protect the species from over-collecting and commercial exploitation.
10. Major Activity Since Last Report: All six populations declined since 1986, five of them drastically. The most stable population is vulnerable to a proposed road improvement project in Logan Canyon, Utah. The Utah Native Plant Society, Forest Service, and Fish and Wildlife Service are conducting population surveys and monitoring of the species. A recovery plan was prepared by the Fish and Wildlife Service. Recreational use and highway development threaten this species in its very limited habitat and there is very little reintroduction potential. The species is probably not recoverable; however, can be maintained with sufficient protection.
11. Major Activity Over Next Reporting Period: Population monitoring activities will begin for the purpose of documenting population changes and status. Species protection will be undertaken through the Section 7 consultation process invoked for proposed construction activities. Horticultural propagation may be considered.
12. Recovery Achieved: 2
13. Information Current as of: September 1990

533 Black-spored quillwort

1. Species: Black-spored quillwort (*Isoetes melanospora*)
2. Listing/Date: Endangered/February 5, 1988
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: All populations were visited and censused by the individual preparing the recovery plan.
11. Major Activity Over Next Reporting Period: Emphasis will be placed on the development of the recovery plan. Key landowners will be contacted and a monitoring program will be initiated if funds become available.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Mat-forming quillwort

534

1. Species: Mat-forming quillwort (*Isoetes tegetiformans*)
2. Listing/Date: Endangered/February 5, 1988
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: All populations were visited in order to have accurate distributional information for upcoming recovery plan.
11. Major Activity Over Next Reporting Period: Emphasis will be on the development of the recovery plan. Anticipate contacting key landowners to encourage their cooperation in the protection of populations on their property. If funding becomes available, a monitoring program will be initiated.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

Hairy rattleweed

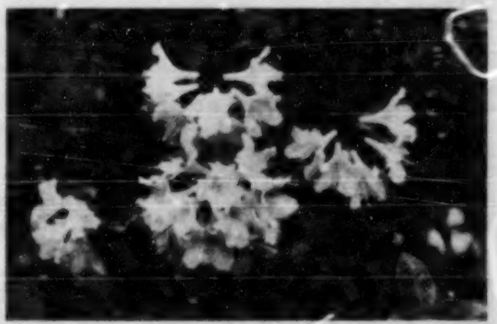
535

1. Species: Hairy rattleweed (*Baptisia arachnifera*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Hairy Rattleweed.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/March 19, 1984
9. Recovery Objective/Criteria: Reclassification to threatened is possible when four self-sustaining populations are secured; recovery requires eight populations.
10. Major Activity Since Last Report: Permanent plots established; nursery-grown plants transplanted (1987).
11. Major Activity Over Next Reporting Period: Georgia Department of Natural Resources is conducting research on this species through Section 6 funds.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

536

Chapman's rhododendron

1. Species: Chapman's rhododendron (*Rhododendron chapmanii*)
2. Listing/Date: Endangered/April 24, 1979
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8C
6. Recovery Plan Title: Recovery plan for Chapman's Rhododendron, *Rhododendron chapmanii*
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 8, 1983
9. Recovery Objective/Criteria: Reclassification to threatened will be possible if: 1) a dense 10-acre population near Hosford maintains itself; 2) the rest of the Hosford population continues to cover 200 acres with at least 500 plants; 3) the Gulf County (Port St. Joe) population continues to occupy at least 200 acres with at least 500 plants; 4) the Clay County population continues to have at least 20 plants; and 5) there is a permanent increase of about 1000 plants at any combination of sites 2, 3, and 4 to provide a total of at least 2,000 plants in the wild.



An evergreen of Florida, Chapman's rhododendron is threatened due to collecting and silvicultural practices. The species requires prescribed burns and the removal of invading hardwoods in order to survive. Landowners in the area have expressed an interest in protecting the species.

10. Major Activity Since Last Report: None in 1987-1990
11. Major Activity Over Next Reporting Period: Visit Camp Blanding (Clay County) population.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

537

Barneby ridge-cress

1. Species: Barneby ridge-cress (=pepper-cress) (*Lepidium barnebyanum*)
2. Listing/Date: Endangered/September 28, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Evaluate recovery needs and prepare a recovery outline.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

McDonald's rock-cress 538

1. Species: McDonald's rock-cress (*Arabis mcdonaldiana*)
2. Listing/Date: Endangered/September 28, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for McDonald's Rock-Cress
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A/1985
9. Recovery Objective/Criteria: Downlist when 5 square miles of species' habitat are protected from mining via mineral withdrawal
10. Major Activity Since Last Report: Preparation of recovery plan for printing.
11. Major Activity Over Next Reporting Period: Publish and distribute recovery plan.
12. Recovery Achieved: 3
13. Information Current as of: July 17, 1990

Shale barren rock-cress 539

1. Species: Shale barren rock-cress (*Arabis serotina*)
2. Listing/Date: Endangered/July 13, 1989
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 11
6. Recovery Plan Title: Shale Barren Rock-Cress Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Downlist—Secure habitat for 20 populations, each with an average population of 50 plants, over 7 years.
10. Major Activity Since Last Report: Life history studies. Ongoing population monitoring and site protection. A technical draft recovery plan is underway. A rainy summer resulted in luxuriant growth in the plant's normally xeric habitat.
11. Major Activity Over Next Reporting Period: Completion of the recovery plan. Continued life history studies, population monitoring, and site protection.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

540 Palo de rosa

1. Species: Palo de rosa (*Ottoschulzia rhodoxylon*)
2. Listing/Date: Endangered/April 10, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 12, 1990

541 Slender rush-pea

1. Species: Slender rush-pea (*Hoffmannseggia tenella*)
2. Listing/Date: Endangered/November 1, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Slender Rush-pea Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 13, 1988
9. Recovery Objective/Criteria: Stabilize.
10. Major Activity Since Last Report: Corpus Christi Botanical Garden is propagating this species. The St. James Catholic Church in Bishop, Texas, has expressed an interest in protecting the slender rush-pea plants that occur in the Bishop Cemetery.
11. Major Activity Over Next Reporting Period: Unknown.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

Large-fruited sand verbena

542

1. Species: Large-fruited sand verbena (*Abronia macrocarpa*)
2. Listing/Date: Endangered/September 28, 1988
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Steve Young at the Mercer Arboretum in Humble, Texas, is propagating this species from seed and has submitted a report on his progress to the Corpus Christi Field Office.
11. Major Activity Over Next Reporting Period: The Texas Natural Heritage Program is working on a recovery plan for this species and may have a draft available later on this fall.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

Lanai (or 'iliahi) sandalwood

543

1. Species: Lanai (or 'iliahi) sandalwood (*Santalum freycinetianum* var. *lanaiense*)
2. Listing/Date: Endangered/January 24, 1986
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 12
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending

Recovery Objective/Criteria: To be developed.

10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None
12. Recovery Achieved: 1
13. Information Current as of: August 1990

544 Cumberland sandwort

1. Species: Cumberland sandwort (*Arenaria cumberlandensis*)
2. Listing/Date: Endangered/June 23, 1988
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To delist the species; recovery criteria have not been established
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

545 Diamond Head schiedea

1. Species: Diamond Head schiedea (*Schiedea adamantis*)
2. Listing/Date: Endangered/February 17, 1984
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Navajo sedge 546

1. Species: Navajo sedge (*Carex specuicola*)
2. Listing/Date: Threatened/May 8, 1985
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Navajo Sedge Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/September 24, 1987
9. Recovery Objective/Criteria: Delist/Criteria include permanent protection of habitat, inventory suitable habitat, monitor known populations, study the potential for hydrological development in habitat area, transplant into protected sites, demonstrate long-term stability of known sites.
10. Major Activity Since Last Report: Navajo Natural Heritage Program personnel located a significant number of previously unknown populations of this species.
11. Major Activity Over Next Reporting Period: No actions are anticipated.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Mauna Kea silversword 547

1. Species: Mauna Kea silversword ('Ahinahina) (*Argyroxiphium sandwicense* ssp. *sandwicense*)
2. Listing/Date: Endangered/March 21, 1986
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Mauna Kea Silversword Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: Manage through protection and propagation to create large, self-sustaining populations on the Island of Hawaii.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Continue work on recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Various Hawaiian state agencies are cooperating with the Fish and Wildlife Service to restore the Mauna Kea silversword, a plant that is endemic to the Island of Hawaii. It is believed that the introduction of species such as goats, sheep, pigs, and cattle was a major cause in its decline. In one recovery effort, silverswords are being grown in nurseries for planting in the wild.

548 Large-flowered skullcap

1. Species: Large-flowered skullcap (*Scutellaria montana*)
2. Listing/Date: Endangered/June 20, 1986
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To delist the species; recovery criteria have not been established yet
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

549 Snakeroot

1. Species: Snakeroot (*Eryngium cuneifolium*)
2. Listing/Date: Endangered/January 21, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: Reclassification to threatened status can be considered when protection of three additional sites is accomplished. Recovery could be considered upon protection of at least 10 additional viable populations at 2 or more sites in Highlands or Polk Counties.
10. Major Activity Since Last Report: Acquisition of a site at Lake Apthorpe by The Nature Conservancy. Fish and Wildlife Service and the State of Florida are planning habitat acquisition.
11. Major Activity Over Next Reporting Period: Land acquisition.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Texas snowbells 550

1. Species: Texas snowbells (*Styrax texana*)
2. Listing/Date: Endangered/October 12, 1984
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Texas Snowbells Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: F/July 31, 1987
9. Recovery Objective/Criteria: Stabilize
10. Major Activity Since Last Report: The two reintroduced populations appear to be doing fine despite high mortality among seedlings that fall outside of screen-wire cages. Apparently, rock squirrels eat the seeds that fall through the cages. A new wild population of Texas snowbell was recently discovered near the Devil's River in Val Verde County, Texas.
11. Major Activity Over Next Reporting Period: Unknown.
12. Recovery Achieved: 1
13. Information Current as of: July 26, 1990

Virginia spiraea 551

1. Species: Virginia spiraea (*Spiraea virginiana*)
2. Listing/Date: Threatened/June 15, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 5
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: Stabilize. This is an interim objective. Maintain all known populations and protect all known sites.
10. Major Activity Since Last Report: Recently listed. Habitat protection and plant propagation efforts are underway.
11. Major Activity Over Next Reporting Period: A recovery plan will be prepared. Recovery activities will include studies of genetic variability, seed production, and habitat requirements. Searches will be conducted for additional populations. Habitat protection activities will increase.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

552 Slender-horned spineflower

1. Species: Slender-horned spineflower (*Dodecahema leptoceras*) (formerly *Centrostegia leptoceras*)
2. Listing/Date: Endangered/September 28, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 4C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/FY 91
9. Recovery Objective/Criteria: Eliminate threats from water storage, flood control, recreational vehicle travel, trash dumping, trespassing, and sand and gravel mining. Protect existing stands.
10. Major Activity Since Last Report: Continued negotiations with the Forest Service, Bureau of Land Management, and sand and gravel miners to protect existing stands and eliminate threats.
11. Major Activity Over Next Reporting Period: (See #10)
12. Recovery Achieved: 1
13. Information Current as of: August 1990

553 Deltoid spurge

1. Species: Deltoid spurge (*Chamaesyce deltoidea* ssp. *deltoidea*)
2. Listing/Date: Endangered/July 18, 1985
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Recovery Plan for Five Pine Rockland Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/October 7, 1988
9. Recovery Objective/Criteria: Reclassification to threatened status can be considered if 10 self-sustaining populations of this species are secured. Delisting can be considered if 20 such populations are secured.
10. Major Activity Since Last Report: The Metropolitan Dade County Department of Environmental Resources Management has coordinated efforts to improve the management of pinelands with *Euphorbia deltoidea* at the former Richmond Field Naval Air Station, which is now divided among various federal and local agencies, plus a county park.
11. Major Activity Over Next Reporting Period: Continuation of management improvement at Richmond.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Narrow-leaved stenogyne 554

1. Species: Narrow-leaved stenogyne (*Stenogyne angustifolia* var. *angustifolia*)
2. Listing/Date: Endangered/October 30, 1979
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 6
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: The State of Hawaii plans to construct an enclosure to protect plants at the Pohakuloa Training Area from herbivores.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

Michaux's sumac 555

1. Species: Michaux's sumac (*Rhus michauxii*)
2. Listing/Date: Endangered/September 28, 1989
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Landowners of major populations have been contacted regarding protection of the plant on their lands; research is being conducted by volunteers on population demography and genetics; reintroduction efforts are under way in Georgia to reestablish an extirpated population.
11. Major Activity Over Next Reporting Period: Continuation of activities described in #10, as well as research on necessary management.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

556 Ash Meadows sunray

1. Species: Ash Meadows sunray (*Enceliopsis nudicaulis* var. *corrugata*)
2. Listing/Date: Threatened/May 20, 1985
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 9
6. Recovery Plan Title: Ash Meadows Species Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/September 28, 1990
9. Recovery Objective/Criteria: Downlisting—all of following conditions met within essential habitat for a period of 5 years: Eradicate all non-native plants and animals; secure aquifer so all spring flows return to historic discharge rates, and maintain water level in Devil's Hole at a minimum level of 1.4 feet below marker; reestablish water to historic channels; secure essential habitat from detrimental human disturbances; document presence of all listed fish species, and Ash Meadows naucorid, in all springs where they were historically present; document presence of Amargosa niterwort in all historic localities; establish and protect refugia populations of Devil's Hole pupfish.

   Delisting—following criteria must be met for 5 years following downlisting: Reestablish native plant and aquatic communities to historic structure and composition within all critical habitat; establish self-sustaining populations of Warm Springs pupfish and Ash Meadows Amargosa pupfish in addition to Ash Meadows speckled dace; document presence of all 14 candidate aquatic insects and snails in all springs which they historically occupied; document presence of all listed plant species and four candidate plant species at all sites which they have historically occupied.
10. Major Activity Since Last Report: Finalized Draft Ash Meadows Recovery Plan. Published Notice of Availability for public review in Federal Register. Monitoring of extant plant populations within Ash Meadows National Wildlife Refuge.
11. Major Activity Over Next Reporting Period: Implement Ash Meadows Species Recovery Plan.
12. Recovery Achieved: 2
13. Information Current as of: September, 1990

Endemic to Ash Meadows, Nevada, the Ash Meadows sunray is one of 12 endangered species found in the area. Threats to the species include livestock grazing, off-road vehicles, and diversions of surface water and groundwater. The Fish and Wildlife Service established the Ash Meadows National Wildlife Refuge for the purpose of conserving these species.

Pitcher's thistle 557

Species: Pitcher's thistle (*Cirsium pitcheri*)

Listing/Date: Threatened/July 18, 1988

Group: Plants

Species Status: Stable

Recovery Priority: 8

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 3

Recovery Plan Stage/Date: U

Recovery Objective/Criteria: Delist. Criteria being developed.

Major Activity Since Last Report: Recovery team has been formed, two meetings have been held, and a draft recovery plan is expected by late 1990. Michigan will soon initiate a landowner contact/protection program. The National Park Service completed the first of a two year study concerning the establishment of long-term monitoring plots and characterizing species distribution.

11. Major Activity Over Next Reporting Period: Complete recovery plan, continue landowner contact program, survey for additional populations, and monitor known areas.

12. Recovery Achieved: 1

13. Information Current as of: July 27, 1990

Sacramento Mountains thistle 558

Species: Sacramento Mountains thistle (*Cirsium vinaceum*)

Listing/Date: Threatened/June 16, 1987

Group: Plants

Species Status: Stable

Recovery Priority: 2

Recovery Plan Title: Pending

Lead Region/Region Responsible for Recovery Plan: Region 2

Recovery Plan Stage/Date: U

Recovery Objective/Criteria: Delist. Develop management that will ensure permanent protection from primary threats of grazing and competition with exotic weeds.

10. Major Activity Since Last Report: Study by New Mexico State University continues on competition between *Cirsium vinaceum* and teasel.

11. Major Activity Over Next Reporting Period: Complete competition study. Review and finalize recovery plan.

12. Recovery Achieved: 1

13. Information Current as of: July 29, 1990

559 San Mateo thornmint

1. Species: San Mateo thornmint (*Acanthomintha obovata* ssp. *duttonii*)
2. Listing/Date: Endangered/September 18, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: None anticipated .
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

560 Florida torreya

1. Species: Florida torreya (*Torreya taxifolia*)
2. Listing/Date: Endangered/January 23, 1984
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Florida Torreya (*Torreya floridana*) Recovery plan.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/September 9, 1986
9. Recovery Objective/Criteria: Produce a genetically diverse collection of healthy trees in cultivation to preserve a representative gene pool. Attempt reintroduction when there is reason to believe the trees would survive to maturity. Research the disease problems of this tree.
10. Major Activity Since Last Report: The Center for Plant Conservation, through Arnold Arboretum, is establishing a cultivated collection of trees. The Nature Conservancy has acquired habitat. A comprehensive program of research into smoke fumigation as a means of inhibiting fungus infections, combined with development of prescribed fire plans for the Torreya preserves, is underway.
11. Major Activity Over Next Reporting Period: Continue research program; begin implementing preserve management with prescribed fire.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Last Chance townsendia

561

1. Species: Last Chance townsendia (*Townsendia aprica*)
2. Listing/Date: Threatened/August 21, 1985
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 5C
6. Recovery Plan Title: Last Chance Townsendia Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: A
9. Recovery Objective/Criteria: Stabilize-Ensure the habitat is protected from environmental degradation, document a total population of at least 30,000 individuals, demonstrate that 6 separate populations of at least 2,000 individuals each is maintained, and ensure that 4 of the 6 populations occur on lands with formal management designations that provide long term, undisturbed habitat.
10. Major Activity Since Last Report: US Department of Agriculture's Bee Biology Laboratory has begun research in the pollination biology of this species. The Service has initiated population monitoring studies of this species. The State Arboretum in Utah has begun to raise plants from seed collected by the Service. A draft recovery plan has been completed.
11. Major Activity Over Next Reporting Period: Population monitoring and habitat protection efforts will continue. Inventories of additional populations or potential reintroduction sites on public lands will be undertaken. Major threats to this species are from mining activities; additional secondary threats are habitat degradation from livestock use and off-road vehicle use, and from road building from increasing human use of habitat.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Pygmy fringe tree

562

1. Species: Pygmy fringe tree (*Chionanthus pygmaeus*)
2. Listing/Date: Endangered/January 21, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: Downlisting to threatened possible with protection of eight viable populations on a minimum of four sites, with sites in each of Highlands, Polk, and Lake Counties.
10. Major Activity Since Last Report: Populations are being protected at recently-purchased Arbuckle State Forest, with management plan being developed with technical assistance of the Nature Conservancy. Purchase of population at Saddle Blanket Lakes by State is under way.
11. Major Activity Over Next Reporting Period: Probable purchase of populations at Catfish Creek by State. Possible purchase(s) of population(s) by Fish and Wildlife Service.
12. Recovery Achieved: 2
13. Information Current as of: July 1990

563

Persistent trillium

1. Species: Persistent trillium (*Trillium persistens*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 8
6. Recovery Plan Title: Persistent Trillium Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/March 27, 1984
9. Recovery Objective/Criteria: Delisting or downlisting (plan does not differentiate) can be considered when at least 75% of the known plants of persistent trillium are protected, appropriate management guidelines are developed and implemented, commercial sources of T. persistens are made available, long-term seed storage is provided, and laws protecting the species are enforced.
10. Major Activity Since Last Report: Additional populations have been searched for, with a few additional colonies being found; population biology and habitat relationships have been researched; major landowners are cooperating in conservation of the species; commercial sources of plants are being developed, and seeds have been deposited in longterm storage facilities.
11. Major Activity Over Next Reporting Period: Continuation activities described in #10, and implementation of appropriate management techniques.
12. Recovery Achieved: 2
13. Information Current as of: June 1990

564

Relict trillium

1. Species: Relict trillium (*Trillium reliquum*)
2. Listing/Date: Endangered/April 4, 1988
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Relict Trillium
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: T/April 1990
9. Recovery Objective/Criteria: Delist when 12 self-sustaining populations are fully protected (2 in AL, 7 in GA, 3 in SC)
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Preparation of final recovery plan
12. Recovery Achieved: 1
13. Information Current as of: June 26, 1990

Dudley Bluffs twinpod 565

1. Species: Dudley Bluffs twinpod (*Physaria obcordata*)
2. Listing/Date: Threatened/February 6, 1990
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 14
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 6
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Final listing was completed.
11. Major Activity Over Next Reporting Period: Section 7 consultations will be completed on the proposed Trans-Colorado pipeline and proposed nahcolite mining.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Uhiuhi 566

1. Species: Uhiuhi (Mezoneuron) (*Mezoneuron kavaiense*)
2. Listing/Date: Endangered/July 8, 1986
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: The State of Hawaii constructed a 1-acre enclosure to protect existing trees at Puuwaawaa from grazing ungulates. A fire break was constructed and some rat control efforts were implemented.
11. Major Activity Over Next Reporting Period: None anticipated.
12. Recovery Achieved: 1
13. Information Current as of: August 1990

567

Hawaiian vetch

1. Species: Hawaiian vetch (*Vicia menziesii*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 2
6. Recovery Plan Title: *Vicia menziesii* Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/October 4, 1984
9. Recovery Objective/Criteria: Data are insufficient to quantify recovery objectives. Interim objectives are to identify, secure, and maintain all existing populations and not allow the populations to decline further. One of the primary recovery goals is the protection of habitat.
10. Major Activity Since Last Report: At least two parcels of land have been identified for acquisition or management, Keauhou/Kilauea (Bishop Estate) and State land at Kulani. A full-time realty position has been established and filled in Honolulu, and negotiations continue for acquisition of land from Bishop Estate. A cooperative agreement has been signed with the State Department of Corrections to develop a management plan at Kulani. The State has recently filled several positions for the management of natural area reserves. These managers will be working in several areas that may support Hawaiian vetc
11. Major Activity Over Next Reporting Period: Activities to protect important habitat will continue.
12. Recovery Achieved: 1
13. Information Current as of: Augu 1990

568

Contra Costa wallflower

1. Species: Contra Costa wallflower (*Erysimum capitatum* var. *angustatum*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Stable
5. Recovery Priority: 6
6. Recovery Plan Title: Recovery Plan for Three Endangered Species Endemic to Antioch Dunes, California
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: F/April 25, 1984
9. Recovery Objective/Criteria: Downlist when known population is stabilized and an undetermined number of populations are established.
10. Major Activity Since Last Report: Wallflower on refuge has been monitored and autecological studies have been undertaken using Section 6 monies.
11. Major Activity Over Next Reporting Period: Continuation of #10.
12. Recovery Achieved: 2
13. Information Current as of: July 17, 1990

The Contra Costa wallflower is found in very restrictive sand dune habitat, know as Antioch Dunes, in California. Portion of the wallflowers' habitat have been pu chased by the Fish and Wildlife Service and managed as Antioch Dunes Nationa Wildlife Refuge. Two other endangered species, the Antioch Dunes evening-primrose and Lange's metalmark butter-fly, are also found in the area.

Wide-leaf warea

569

1. Species: Wide-leaf warea (*Warea amplexifolia*)
2. Listing/Date: Endangered/April 26, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U. T/A anticipated 1991
9. Recovery Objective/Criteria: This is now a rare plant, having suffered severe habitat loss.
10. Major Activity Since Last Report: Bok Tower Gardens is experimenting with expanding the native population on its property.
11. Major Activity Over Next Reporting Period: None anticipated
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Kral's water-plantain

570

1. Species: Kral's water-plantain (*Sagittaria secundifolia*)
2. Listing/Date: Threatened/April 13, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: None
11. Major Activity Over Next Reporting Period: Initiate draft recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: June 1990

571 Cooley's water-willow

1. Species: Cooley's water-willow (*Justicia cooleyi*)
2. Listing/Date: Endangered/July 27, 1989
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Brooksville Bellflower and Cooley's Water—Willow.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: U
9. Recovery Objective/Criteria: To be developed.
10. Major Activity Since Last Report: Technical/agency draft recovery plan in preparation.
11. Major Activity Over Next Reporting Period: Complete recovery plan.
12. Recovery Achieved: 1
13. Information Current as of: July 1990

572 Papery whitlow-wort

1. Species: Papery whitlow-wort (*Paronychia chartacea*)
2. Listing/Date: Threatened/January 21, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 8
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: Delisting can be considered when this species is protected at 10 sites, including at least one in Orange and/or Osceola Counties, and at least 3 each in Polk and Highlands Counties.
10. Major Activity Since Last Report: State acquisition (and planned acquisitions) at Arbuckle Lake, Saddle Blanket Lakes, and Catfish Creek, plus acquisition of a tract at Lake Arbuckle by The Nature Conservancy has contributed to recovery of this plant.
11. Major Activity Over Next Reporting Period: Continue land acquisition, including acquisition by the Fish and Wildlife Service.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Clay-loving wild-buckwheat 573

Species: Clay-loving wild-buckwheat (*Eriogonum pelinophilum*)

Listing/Date: Endangered/July 13, 1984

Group: Plants

Species Status: Stable

Recovery Priority: 5

Recovery Plan Title: Clay-loving Wild-buckwheat Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 6

Recovery Plan Stage/Date: F/November 10, 1988

Recovery Objective/Criteria: Downlist—Secure 10 populations (sites). Delist—Secure 20 populations (sites).

10. Major Activity Since Last Report: The biological opinion was completed on the AB Lateral Project calling for protection of an additional population to offset loss of plants from the pipeline.

11. Major Activity Over Next Reporting Period: A taxonomic study comparing this species with E. *clavellatum* will begin in FY 91 to verify the species' taxonomic relationship.

12. Recovery Achieved: 1

13. Information Current as of: July 1990

Gypsum wild buckwheat 574

Species: Gypsum wild buckwheat (*Eriogonum gypsophilum*)

Listing/Date: Threatened/January 19, 1981

Group: Plants

Species Status: Stable

Recovery Priority: 8

Recovery Plan Title: Gypsum Wild Buckwheat Recovery Plan

Lead Region/Region Responsible for Recovery Plan: Region 2

Recovery Plan Stage/Date: F/March 30, 1984

Recovery Objective/Criteria: Delist. Maintain a population of 10,000 individuals in a single stabilized population.

Major Activity Since Last Report: An off-road vehicle closure has been accomplished for the critical habitat on Bureau of Land Management (BLM) land. The BLM continues monitoring the status of the main population through permanent plots. The understanding of species biology has been improved through pollinator studies by U.S. Department of Agriculture (USDA) and reproduction studies by the State of New Mexico. The State of New Mexico has inventoried for new populations through USDA contract.

11. Major Activity Over Next Reporting Period: Continue monitoring and biological studies.

12. Recovery Achieved: 2

13. Information Current as of: July 27, 1990

575 Texas wild-rice

1. Species: Texas wild-rice (*Zizania texana*)
2. Listing/Date: Endangered/April 26, 1978
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2C
6. Recovery Plan Title: San Marcos Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 2
8. Recovery Plan Stage/Date: R/F/April 8, 1985
9. Recovery Objective/Criteria: Downlist when flow in San Marcos River is ensured. This objective and criterion will likely be revised in the Recovery Plan revision underway.
10. Major Activity Since Last Report: Monthly monitoring of Texas wild-rice continued and the location of wild-rice plants throughout the species' range was remapped in July 1990 (Section 6 project). A River Management Plan is being developed (with Section 6 funds) to address local threats and outline management and protection needs. Aquifer water user groups have been meeting to try to develop a water use plan agreeable to all. Hopefully, this plan will provide for maintaining critical spring flows.
11. Major Activity Over Next Reporting Period: Monitoring will continue. River Management Plan will be completed and ready for implementation. Negotiations among aquifer user groups will begin to provide for spring flow maintenance.
12. Recovery Achieved: 1
13. Information Current as of: July, 1990

576 Malheur wirelettuce

1. Species: Malheur wirelettuce (*Stephanomeria malheurensis*)
2. Listing/Date: Endangered/November 10, 1982
3. Group: Plants
4. Species Status: Unknown
5. Recovery Priority: 2
6. Recovery Plan Title: *Stephanomeria malheurensis* (Malheur Wirelettuce) Recovery Plan
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: A/June 30, 1986
9. Recovery Objective/Criteria: Wild and newly established populations are protected and maintain themselves for a period of time determined by recovery action.
10. Major Activity Since Last Report: Seed bank experiments, seasonal monitoring, etc.
11. Major Activity Over Next Reporting Period: Fall monitoring and effects of exotics via chemical analysis.
12. Recovery Achieved: 1
13. Information Current as of: August 23, 1990

Wireweed

577

1. Species: Wireweed (*Polygonella basiramia*)
2. Listing/Date: Endangered/January 21, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: This plant has been found at an important new site since it was listed as endangered. When the identifications of plants from currently protected sites is confirmed, and suitable management is established for these sites, the species can be reclassified as threatened. Recovery and delisting can be considered when at least one more site is protected in Highlands County.
10. Major Activity Since Last Report: Acquisition by the State of habitat at Saddle Blanket Lakes and Catfish Creek is benefiting this species.
11. Major Activity Over Next Reporting Period: The Fish and Wildlife Service is planning possible acquisition of habitat for this species.
12. Recovery Achieved: 3
13. Information Current as of: July 1990

Hoover's woolly-star

578

1. Species: Hoover's woolly-star (*Eriastrum hooveri*)
2. Listing/Date: Threatened/July 19, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title. Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: The Bureau of Land Management likely will survey their lands for this species because of potential oil and gas leasing and conflicts.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

579 Santa Ana River woolly-star

1. Species: Santa Ana River woolly-star (*Eriastrum densifolium* ssp. *sanctorum*)
2. Listing/Date: Endangered/September 28, 1987
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 6C
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: U/FY 91
9. Recovery Objective/Criteria: Eliminate threat from flood control, off-road vehicle travel, trash dumping, and sand and gravel mining.
10. Major Activity Since Last Report: Continued negotiations with the Corps of Engineers (Corps), and miners to eliminate threats. Population monitoring and life history studies funded by the Corps.
11. Major Activity Over Next Reporting Period: (See #10)
12. Recovery Achieved: 1
13. Information Current as of: August 1990

580 San Joaquin wooly-threads

1. Species: San Joaquin wooly-threads (*Lembertia congdonii*)
2. Listing/Date: Endangered/July 19, 1990
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 2
6. Recovery Plan Title: Pending
7. Lead Region/Region Responsible for Recovery Plan: Region 1
8. Recovery Plan Stage/Date: Pending
9. Recovery Objective/Criteria: To be developed
10. Major Activity Since Last Report: Received listing protection under the Endangered Species Act.
11. Major Activity Over Next Reporting Period: Metropolitan Bakersfield Habitat Conservation Plan may affect some habitat preservation and enhancement in the Kern Water Bank area for the species. The Bureau of Land Management likely will survey their lands for this species because of potential oil and gas leasing conflicts.
12. Recovery Achieved: 1
13. Information Current as of: September 1990

1. Species: Florida ziziphus (*Ziziphus celata*)
2. Listing/Date: Endangered/July 27, 1989
3. Group: Plants
4. Species Status: Declining
5. Recovery Priority: 5
6. Recovery Plan Title: Recovery Plan for Eleven Florida Scrub Plant Species.
7. Lead Region/Region Responsible for Recovery Plan: Region 4
8. Recovery Plan Stage/Date: F/January 29, 1990
9. Recovery Objective/Criteria: Recovery of *Ziziphus celata* is conditional on there being enough genetically distinct individuals to constitute a minimum viable population.
10. Major Activity Since Last Report: The discoverer of this plant in the wild has leased the one site where *Ziziphus celata* occurs in undisturbed vegetation. Bok Tower Gardens is successfully propagating the species for the Center for Plant Conservation.
11. Major Activity Over Next Reporting Period:
12. Recovery Achieved: 1
13. Information Current as of: July 1990

Index of Listed Species by Common Name

* Listed species with no species account number are the responsibility of the National Marine Fisheries Service and are not subjects of this report.

Species Account Number	Species	Listed As
343	*Achyranthes splendens* var. *rotundata* (=Chaff-flower)	E
118	Ae'o (=Stilt, Hawaiian)	E
344	Agave, Arizona	E
547	'Ahinahina (Mauna Kea silversword)	E
51	'Akepa, Hawaii (honeycreeper)	E
52	'Akepa, Maui (honeycreeper)	E
53	'Akialoa, Kauai (honeycreeper)	E
54	'Akiapola'au (honeycreeper)	E
345	'Akoko, Ewa Plains	E
60	'Alae-ke'oke'o (=Coot, Hawaiian)	E
66	'Alala (Hawaiian crow)	E
346	Amphianthus, little	T
310	Amphipod, Hay's spring	E
137	Anole, Culebra Island giant	E
347	Arrowhead, bunched	E
348	Aster, decurrent false	T
349	Aster, Florida golden	E
350	Aster, Ruth's golden	E
351	Avens, spreading	E
352	Barberry, Truckee	E
353	Bariaco	E
1	Bat, gray	E
2	Bat, Hawaiian hoary	E
3	Bat, Indiana	E
4	Bat, little Mariana fruit	E
5	Bat, Mariana fruit	E
6	Bat, Mexican long-nosed	E
7	Bat, Ozark big-eared	E
8	Bat, Sanborn's long-nosed	E
9	Bat, Virginia big-eared	E
10	Bear, grizzly or brown	T
354	Bear-poppy, dwarf	E
355	Beardtongue, Penland	E
356	Beauty, Harper's	E
320	Beetle, American burying (=giant carrion)	E
321	Beetle, delta green ground	T
322	Beetle, Kretschmarr Cave mold	E
323	Beetle, northeastern beach tiger	T
324	Beetle, Puritan tiger	T
325	Beetle, Tooth Cave ground	E
326	Beetle, valley elderberry longhorn	T
357	Bellflower, Brooksville	E
358	Bidens, cuneate	E
359	Birch, Virginia round-leaf	E
361	Bird's-beak, salt marsh	E
360	Bird's-beak, palmate-bracted	E

pecies ccount umber	Species	Listed As
362	Bittercress, small-anthered	E
419	Bitterweed, Texas (=Texas prairie dawn-flower)	E
55	Blackbird, yellow-shouldered	E
364	Bladderpod, lyrate	T
366	Bladderpod, white	E
365	Bladderpod, Missouri	E
363	Bladderpod, Dudley Bluffs	T
367	Blazingstar, Ash Meadows	T
368	Blazingstar, Heller's	T
369	Blazingstar, scrub	E
370	Blue-star, Kearney's	E
371	Bluet, Roan Mountain	E
138	Boa, Mona	T
139	Boa, Puerto Rican	E
140	Boa, Virgin Islands tree	E
56	Bobwhite, masked (quail)	E
372	Bonamia, Florida	T
373	Boxwood, Vahl's	E
57	Broadbill, Guam	E
374	Broom, San Clemente Island	E
375	Buckwheat, steamboat	E
376	Bush-clover, prairie	T
377	Bush-mallow, San Clemente Island	E
378	Buttercup, autumn	E
327	Butterfly, bay checkerspot	T
328	Butterfly, El Segundo blue	E
329	Butterfly, Lange's metalmark	E
330	Butterfly, lotis blue	E
331	Butterfly, mission blue	E
332	Butterfly, Oregon silverspot	T
333	Butterfly, Palos Verde blue	E
334	Butterfly, San Bruno elfin	E
335	Butterfly, Schaus swallowtail	E
336	Butterfly, Smith's blue	E
379	Button, Mohr's Barbara	E
380	Cactus, Arizona hedgehog	E
381	Cactus, Bakersfield	E
382	Cactus, black lace	E
383	Cactus, Brady pincushion	E
384	Cactus, bunched cory	T
385	Cactus, Chisos Mtn. hedgehog	T
386	Cactus, Cochise pincushion	T
387	Cactus, Key tree	E
388	Cactus, Knowlton	E
389	Cactus, Kuenzler hedgehog	E
390	Cactus, Lee pincushion	T

Species Account Number	Species	Listed As
391	Cactus, Lloyd's hedgehog	E
392	Cactus, Lloyd's Mariposa	T
393	Cactus, Mesa Verde	T
394	Cactus, Nellie cory	E
395	Cactus, Nichol's Turk's head	E
396	Cactus, Peebles Navajo	E
397	Cactus, San Rafael	E
398	Cactus, Siler pincushion	E
399	Cactus, Sneed pincushion	E
400	Cactus, spineless hedgehog	E
401	Cactus, Tobusch fishhook	E
402	Cactus, Unita Basin hookless	T
403	Cactus, Wright fishhook	E
58	Caracara, Audubon's (Florida) crested	T
11	Caribou, woodland	E
404	*Cassia mirabilis* (=Sci. name)	E
179	Catfish, Yaqui	T
180	Cavefish, Alabama	E
181	Cavefish, Ozark	T
405	Centaury, spring-loving	T
343	Chaff-flower, round-leaved (=Achyranthes splendens)	E
423	*Chamaesyce garberi* (=Spurge, Garber's)	T
406	Checker-mallow, pedate	E
182	Chub, bonytail	E
189	Chub, bonytail (=Pahranagat roundtail)	E
183	Chub, Borax Lake	E
184	Chub, Chihuahua	T
185	Chub, humpback	E
186	Chub, Hutton tui	T
187	Chub, Mohave tui	E
188	Chub, Owens tui	E
189	Chub, Pahranagat roundtail (=bonytail)	E
190	Chub, slender	T
191	Chub, Sonora	T
192	Chub, spotfin	T
193	Chub, Virgin River	E
194	Chub, Yaqui	E
407	Chumbo, higo	T
408	Cinquefoil, Robbins'	E
409	Cliff-rose, Arizona	E
410	Clover, running buffalo	E
59	Condor, California	E
411	Coneflower, Tennessee purple	E
60	Coot, Hawaiian (='alae-ke'oke'o)	E
168	Coqui, golden	T
12	Cougar, eastern	E

pecies ccount umber	Species	Listed As
412	Coyote-thistle, Loch Lomond	E
61	Crane, Mississippi sandhill	E
62	Crane, whooping	E
311	Crayfish, Cave	E
312	Crayfish, Nashville	E
313	Crayfish, Shasta (=placid)	E
63	Creeper, Hawaiian	E
64	Creeper, Molokai (=kakawahie)	E
65	Creeper, Oahu (=alauwahio)	E
413	Cress, toad-flax	E
141	Crocodile, American	E
142	Crocodile, saltwater	E
66	Crow, Hawaiian (='alala)	E
67	Crow, Mariana	E
195	Cui-ui	E
68	Curlew, eskimo	E
414	Cycladenia, Jones	T
415	Cypress, Santa Cruz	E
196	Dace, Ash Meadows speckled	E
197	Dace, blackside	T
198	Dace, Clover Valley speckled	E
199	Dace, desert	T
200	Dace, Foskett speckled	T
201	Dace, Independence Valley speckled	E
202	Dace, Kendall Warm Springs	E
203	Dace, Moapa	E
416	Daisy, lakeside	T
417	Daisy, Maguire	E
418	*Daphnopsis hellerana* (=Sci. Name)	E
204	Darter, amber	E
205	Darter, bayou	T
206	Darter, boulder (=Elk River)	E
207	Darter, fountain	E
208	Darter, leopard	T
209	Darter, Maryland	E
210	Darter, Niangua	T
211	Darter, Okaloosa	E
212	Darter, slackwater	T
213	Darter, snail	T
214	Darter, watercress	E
419	Dawn-flower, Texas prairie	E
13	Deer, Columbian white-tailed	E
14	Deer, key	E
420	Dogweed, ashy	E
421	Dropwort, Canby's	E
69	Duck, Hawaiian (koloa)	E

Species Account Number	Species	Listed As
70	Duck, Laysan	E
15	Dugong	E
71	Eagle, bald	E,T
422	Erubia	E
423	*Euphorbia (Chamaesyce) garberi* (=Spurge, Garber's)	T
424	Evening-primrose, Antioch Dunes	E
425	Evening-primrose, Eureka Valley	E
426	Evening-primrose, San Benito	T
72	Falcon, American peregrine (Alaska plan)	E
73	Falcon, American peregrine (Eastern plan)	E
74	Falcon, American peregrine (Western plan)	E
75	Falcon, Arctic peregrine	T
76	Falcon, northern aplomado	E
271	Fanshell	E
272	Fatmucket, Arkansas	T
427	Fern, Aleutian shield	E
428	Fern, American hart's-tongue	T
429	Fern, elfin tree	E
16	Ferret, black-footed	E
430	Fiddleneck, large-flowered	E
77	Finch, Laysan (honeycreeper)	E
78	Finch, Nihoa (honeycreeper)	E
431	Fleabane, rhizome	T
432	Four-o'clock, MacFarlane's	E
17	Fox, San Joaquin kit	E
433	Frankenia, Johnston's	E
215	Gambusia, Big Bend	E
216	Gambusia, Clear Creek	E
217	Gambusia, Pecos	E
218	Gambusia, San Marcos	E
434	Gardenia, Hawaiian (na'u)	E
143	Gecko, Monito	E
435	*Geocarpon minimum* (=Sci. Name)	T
436	Gerardia, sandplain	E
437	Globe-berry, Tumamoc	E
438	Goetzea, beautiful (matabuey)	E
439	Goldenrod, Blue Ridge	T
440	Goldenrod, Houghton's	T
441	Goldenrod, Short's	E
442	Goldenrod, white-haired	T
79	Goose, Aleutian Canada	E
80	Goose, Hawaiian (nene)	E
443	Gooseberry, Miccosukee (Florida)	T
444	Gouania, Hillebrand's (=*G. hillebrandii*)	E
445	Grass, Eureka Dune	E
446	Grass, Solano	E

Species Account Number	Species	Listed As
447	Groundsel, San Francisco Peaks	T
448	Gumplant, Ash Meadows	T
449	Haplostachya, narrow-leaved (=*H. h.* var. *angustifolia*)	E
449	*Haplostachys haplostachya* var. *angustifolia*	E
450	Harperella	E
340	Harvestman, Bee Creek Cave	E
81	Hawk, Hawaiian (io)	E
451	Heartleaf, dwarf-flowered	T
452	Heather, mountain golden	T
273	Heelsplitter, inflated	T
407	Higo chumbo	T
453	Higuero de Sierra	E
454	Holly, Cook's	E
82	Honeycreeper, crested (ʻakohekohe)	E
455	Hypericum, highlands scrub	E
144	Iguana, Mona ground	T
456	Indian paintbrush, San Clemente Island	E
543	ʻIliahi (Lanai sandalwood)	E
81	Io (Hawaiian hawk)	E
457	Iris, dwarf lake	T
314	Isopod, Madison Cave	T
315	Isopod, Socorro	E
458	Ivesia, Ash Meadows	T
19	Jaguarundi	E
18	Jaguarundi	E
83	Jay, Florida scrub	T
459	Jewelflower, California	E
460	Kauai hau kuahiwi	E
219	Killifish, Pahrump	E
84	Kingfisher, Guam Micronesian	E
85	Kite, Everglade snail	E
69	Koloa (Hawaiian duck)	E
461	Koʻoloaʻula	E
452	Kokiʻo (=hau-heleʻula or Hawaii tree cotton)	E
463	Kokiʻo, Cooke's	E
464	Ladies'-tresses, Navasota	E
465	Lagu, Hyan	E
466	Larkspur, San Clemente Island	E
467	Lead-plant, Crenulate	E
468	Leather flower, Alabama	E
469	Lily, Minnesota trout	E
470	*Lipochaeta venosa* (=Sci. Name) = Nehe	E
471	Liveforever, Santa Barbara Island	E
145	Lizard, blunt-nosed leopard	E
146	Lizard, Coachella Valley fringe-toed	T
147	Lizard, Island night	T

Species Account Number	Species	Listed As
148	Lizard, St. Croix ground	E
472	Locoweed, Fassett's	T
220	Logperch, Conasauga	E
221	Logperch, Roanoke	E
473	Lomatium, Bradshaw's	E
474	Loosestrife, rough-leaved	E
475	Lousewort, Furbish	E
476	Lupine, scrub	E
222	Madtom, Neosho	T
223	Madtom, Scioto	E
224	Madtom, smoky	E
225	Madtom, yellowfin	T
86	Mallard, Mariana	E
477	Mallow, Kern	E
478	Mallow, Peter's Mountain	E
479	Manaca, palma de	T
479	Palma de Manaca	T
20	Manatee, West Indian (Florida)	E
480	Manzanita, Presido (=Raven's)	E
481	Meadowrue, Cooley's	E
87	Megapode, Micronesian (La Perouse's)	E
482	Mesa-mint, San Diego	E
483	Milk-vetch, Ash Meadows	T
484	Milk-vetch, heliotrope	T
485	Milk-vetch, Jesup's	E
486	Milk-vetch, Mancos	E
487	Milk-vetch, Osterhout	E
488	Milkpea, Small's	E
489	Milkweed, Mead's	T
490	Milkweed, Welsh's	T
88	Millerbird, Nihoa (old world warbler)	E
226	Minnow, loach	T
491	Mint, Garrett's (=scrub, in part)	E
492	Mint, Lakela's	E
493	Mint, longspurred	E
494	Mint, scrub	E
89	Monarch, Tinian	T
496	Monkshood, northern wild	T
495	Monkey-flower, Michigan	E
90	Moorhen (gallinule), Hawaiian common	E
91	Moorhen (gallinule), Mariana common	E
337	Moth, Kern primrose sphinx	T
21	Mouse, Alabama beach	E
22	Mouse, Anastasia Island beach	E
23	Mouse, Choctawahatchee beach	E
24	Mouse, Key Largo cotton	E

Species Account Number	Species	Listed As
25	Mouse, Perdido Key beach	E
26	Mouse, salt marsh harvest	E
27	Mouse, southeastern beach	T
274	Mussel, Curtus'	E
275	Mussel, dwarf wedge	E
279	Mussel, golf stick pearly (=ring pink)	E
276	Mussel, Judge Tait's	E
277	Mussel, Marshall's	E
278	Mussel, penitent	E
279	Mussel, ring pink (=golf stick pearly)	E
497	Mustard, Carter's	E
498	Mustard, slender-petaled	E
434	Na'u (Hawaiian gardenia)	E
338	Naucorid, Ash Meadows	T
499	Naupaka, dwarf	E
500	Negra, cobana	T
470	Nehe (*Lipochaeta venosa* =Sci. Name)	E
92	Nightjar (whip-poor-will), Puerto Rico	E
505	Nigua	E
501	Niterwort, Amargosa	E
93	Nukupu'u (honeycreeper)	E
94	'O'o, Kauai (= 'O'o 'A'a)(honeyeater)	E
95	'O'u (honeycreeper)	E
502	Oak, Hinckley	T
28	Ocelot	E
503	Orchid, eastern prairie fringed	T
504	Orchid, western prairie fringed	T
29	Otter, southern sea	T
96	Owl, northern spotted	T
97	Palila (honeycreeper)	E
505	Palo de nigua	E
506	Palo de Ramon	E
507	Panicgrass, Carter's	E
30	Panther, Florida	E
98	Parrot, Puerto Rican	E
99	Parrotbill, Maui (honeycreeper)	E
508	Pawpaw, beautiful	E
509	Pawpaw, four-petal	E
510	Pawpaw, Rugel's	E
280	Pearlshell, Louisiana	E
281	Pearly mussel, Alabama lamp	E
282	Pearly mussel, Appalachain monkeyface	E
283	Pearly mussel, birdwing	E
284	Pearly mussel, cracking	E
285	Pearly mussel, Cumberland bean	E
286	Pearly mussel, Cumberland monkeyface	E

Species Account Number	Species	Listed As
287	Pearly mussel, Curtis'	E
288	Pearly mussel, dromedary	E
289	Pearly mussel, green-blossom	E
290	Pearly mussel, Higgins' eye	E
291	Pearly mussel, little-wing	E
292	Pearly mussel, orange-footed	E
293	Pearly mussel, pale lilliput	E
294	Pearly mussel, pink mucket	E
295	Pearly mussel, purple cat's paw	E
296	Pearly mussel, tubercled-blossom	E
297	Pearly mussel, turgid-blossom	E
298	Pearly mussel, white cat's paw	E
299	Pearly mussel, white wartyback	E
300	Pearly mussel, yellow-blossom	E
100	Pelican, brown (California plan)	E
101	Pelican, brown (Eastern plan)	E
511	Pelos del diablo	E
512	Pennyroyal, McKittrick	T
513	Pennyroyal, Todsen's	E
514	Penstemon, blowout	E
515	Peperomia, Wheeler's	E
102	Petrel, Hawaiian dark-rumped	E
516	Phacelia, clay	E
517	Phacelia. North Park	E
103	Pigeon, Puerto Rican plain	E
301	Pigtoe, fine-rayed	E
302	Pigtoe, rough	E
303	Pigtoe, shiny	E
518	Pink, swamp	T
519	Pitaya, Davis' green	E
520	Pitcher-plant, Alabama canebrake	E
521	Pitcher-plant, green	E
522	Pitcher-plant, mountain sweet	E
104	Plover, piping (Atlantic coastal plan)	T
105	Plover, piping (Interior plan)	E,T
523	Plum, scrub	E
106	Po'ouli (honeycreeper)	E
304	Pocketbook, fat	E
305	Pocketbook, speckled	E
524	Pogonia, small whorled	E
525	Polygala, tiny	E
526	Pondberry	E
527	Poppy, Sacramento prickly	E
528	Poppy-mallow, Texas	E
529	Potato-bean, Price's	T
107	Prairie-chicken, Attwater's greater	E

Species Account Number	Species	Listed As
31	Prairie dog, Utah	T
530	Prickly-apple, fragrant	E
531	Prickly-ash, St. Thomas	E
532	Primrose, Maguire	T
32	Pronghorn, Sonoran	E
341	Pseudoscorpion, Tooth Cave	E
227	Pupfish, Ash Meadows Amargosa	E
228	Pupfish, Comanche Springs	E
229	Pupfish, desert	E
230	Pupfish, Devil's Hole	E
231	Pupfish, Leon Springs	E
232	Pupfish, Owens	E
233	Pupfish, Warm Springs	E
533	Quillwort, black spored	E
534	Quillwort, mat-forming	E
33	Rabbit, Lower Keys	E
108	Rail, California clapper	E
109	Rail, Guam	E
110	Rail, light-footed clapper	E
111	Rail, Yuma clapper	E
34	Rat, Fresno kangaroo	E
35	Rat, giant kangaroo	E
36	Rat, Morro Bay kangaroo	E
37	Rat, Stephens' kangaroo	E
38	Rat, Tipton kangaroo	E
149	Rattlesnake, New Mexican ridge-nosed	T
535	Rattleweed, hairy	E
536	Rhododendron, Chapman	E
537	Ridge-cress (=pepper-cress), Barneby	E
306	Riffle shell, tan	E
538	Rock-cress, McDonald's	E
539	Rock-cress, shale barren	E
540	Rosa, palo de	E
541	Rush-pea, slender	E
169	Salamander, Cheat Mountain	T
170	Salamander, desert slender	E
171	Salamander, Red Hills	T
172	Salamander, San Marcos	T
173	Salamander, Santa Cruz long-toed	E
174	Salamander, Shenandoah	E
175	Salamander, Texas blind	E
	Salmon, chinook *	T
542	Sand-verbena, large-fruited	E
543	Sandalwood, Lanai ('iliahi)	E
544	Sandwort, Cumberland	E
545	Schiedea, Diamond Head	E

Species Account Number	Species	Listed As
234	Sculpin, pygmy	T
	Sea-lion, Steller (=northern) *	T
	Seal, Caribbean monk *	E
	Seal, Guadalupe fur *	T
	Seal, Hawaiian monk *	E
546	Sedge, Navajo	T
262	Shagreen, Magazine Mountain	T
112	Shearwater, Newell's Townsend's	T
307	Shell, stirrup	E
235	Shiner, beautiful	T
236	Shiner, Cape Fear	E
237	Shiner, Pecos bluntnose	T
39	Shrew, Dismal Swamp southeastern	T
113	Shrike, San Clemente loggerhead	E
316	Shrimp, Alabama cave	E
317	Shrimp, California freshwater	E
318	Shrimp, Kentucky Cave	E
319	Shrimp, Squirrel Chimney (=Florida) Cave	T
238	Silverside, Waccamaw	T
547	Silversword, Mauna Kea ('Ahinahina)	E
150	Skink, blue-tailed mole	T
151	Skink, sand	T
339	Skipper, Pawnee montane	T
548	Skullcap, large-flowered	E
263	Snail, Chittenango ovate amber	T
264	Snail, flat-spired three-toothed	T
265	Snail, Iowa Pleistocene	E
266	Snail, Noonday	T
267	Snails, Oahu tree (19 species)	E
268	Snail, painted snake coiled forest	T
269	Snail, Stock Island	T
270	Snail, Virginia fringed mountain	E
152	Snake, Atlantic salt marsh	T
153	Snake, Concho water	T
154	Snake, eastern indigo	T
155	Snake, San Francisco garter	E
549	Snakeroot	E
550	Snowbells, Texas	E
114	Sparrow, Cape Sable seaside	E
115	Sparrow, dusky seaside	E
116	Sparrow, Florida grasshopper	E
117	Sparrow, San Clemente sage	T
342	Spider, Tooth Cave	E
239	Spikedace	T
240	Spinedace, Big Spring	T
241	Spinedace, Little Colorado	T

Species Account Number	Species	Listed As
242	Spinedace, White River	E
552	Spineflower, slender-horned	E
308	Spinymussel, James River (=Virginia)	E
309	Spinymussel, Tar River	E
551	Spiraea, Virginia	T
243	Springfish, Hiko White River	E
244	Springfish, Railroad Valley	T
245	Springfish, White River	E
553	Spurge, Delta	E
423	Spurge, Garber's	T
246	Squawfish, Colorado	E
40	Squirrel, Carolina northern flying	E
41	Squirrel, Delmarva Peninsula fox	E
42	Squirrel, Mount Graham red	E
43	Squirrel, Virginia northern flying	E
554	Stenogyne angustifolia var. angustifolia	E
247	Stickleback, unarmored threespine	E
118	Stilt, Hawaiian (=Ae'o)	E
119	Stork, wood	E
248	Sturgeon, pallid	E
	Sturgeon, shortnose *	E
249	Sucker, June	E
250	Sucker, Lost River	E
251	Sucker, Modoc	E
252	Sucker, shortnose	E
253	Sucker, Warner	T
555	Sumac, Michaux's	E
556	Sunray, Ash Meadows	T
120	Swiftlet, Mariana gray (=Vanikoro)	E
121	Tern, California least	E
122	Tern, least	E
123	Tern, roseate	E,T
557	Thistle, Pitcher's	T
558	Thistle, Sacramento Mountains	T
559	Thornmint, San Mateo	E
124	Thrush, large Kauai	E
125	Thrush, Molokai (oloma'o)	E
126	Thrush, small Kauai (puaiohi)	E
176	Toad, Houston	E
177	Toad, Puerto Rican crested	T
178	Toad, Wyoming	E
254	Topminnow, Gila (incl. Yaqui)	E
560	Torreya, Florida	E
156	Tortoise, desert	T
157	Tortoise, gopher	T
127	Towhee, Inyo brown	T

Species Account Number	Species	Listed As
561	Townsendia, Last Chance	T
562	Tree, pygmy fringe	E
563	Trillium, persistent	E
564	Trillium, relict	E
255	Trout, Apache	T
256	Trout, Gila	E
257	Trout, greenback cutthroat	T
258	Trout, Lahontan cutthroat	T
259	Trout, Little Kern golden	T
260	Trout, Paiute cutthroat	T
158	Turtle, Alabama red-bellied	E
159	Turtle, flattened musk	T
160	Turtle, green sea	E,T
161	Turtle, hawksbill sea (=carey)	E
162	Turtle, Kemp's (Atlantic) ridley sea	E
163	Turtle, leatherback sea	E
164	Turtle, loggerhead sea	T
165	Turtle, olive (Pacific) ridley sea	E,T
166	Turtle, Plymouth red-bellied	E
167	Turtle, ringed sawback	T
565	Twinpod, Dudley Bluffs	T
566	Uhiuhi	E
120	Vanikoro (=Swiftlet, Mariana gray)	E
567	Vetch, Hawaiian	E
128	Vireo, black-capped	E
129	Vireo, least Bell's	E
44	Vole, Amargosa	E
45	Vole, Hualapai Mexican	E
568	Wallflower, Contra Costa	E
130	Warbler (willow), nightingale reed	E
131	Warbler (wood), Bachman's	E
132	Warbler (wood), golden-cheeked	E
133	Warbler (wood), Kirtland's	E
569	Warea, wide-leaf	E
570	Water-plantain, Kral's	T
571	Water-willow, Cooley's	E
	Whale, blue *	E
	Whale, bowhead *	E
	Whale, finback *	E
	Whale, gray *	E
	Whale, humpback *	E
	Whale, right *	E
	Whale, Sei *	E
	Whale, sperm *	E
92	Whip-poor-will, (nightjar) Puerto Rico	E
134	White-eye, bridled	E

Species Account Number	Species	Listed As
572	Whitlow-wort, papery	T
573	Wild-buckwheat, clay-loving	E
574	Wild-buckwheat, gypsum	T
575	Wild-rice, Texas	E
576	Wire-lettuce, Malheur	E
577	Wireweed	E
46	Wolf, gray (Eastern Timber Wolf plan)	E,T
47	Wolf, gray (Mexican Wolf plan)	E
48	Wolf, gray (Rocky Mtn. plan)	E
49	Wolf, red	E
135	Woodpecker, ivory-billed	E
136	Woodpecker, red-cockaded	E
50	Woodrat, Key Largo	E
578	Woolly-star, Hoover's	T
579	Woolly-star, Santa Ana River	E
580	Wooly-threads, San Joaquin	E
261	Woundfin	E
581	Ziziphus, Florida	E

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